Editorial

The Role of Long-Term Contraceptive Services in the Covid-19 Pandemic Era

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When will the Covid-19 Pandemic Era end? no one can answer it with certainty. Meanwhile, the new normal life must continue, including the new normal in reproductive health control, such as the choice of contraceptive method. Both the American Reproductive Health Association (ASRM), Europe (ESHRE), and Indonesia through the Ministry of Health, suggest people postpone pregnancy during this pandemic by utilizing modern contraceptive methods, such as hormonal or Intrauterine Device (IUD) because they are not only effective but also long-term.[1-3]

Although it is not advisable to come to the clinic because there are limitations for physical examination, services can still be provided via telemedicine. With telemedicine, service providers can identify problems during contraceptive counselling. Furthermore, POP and COC acceptors via telemedicine are advised to continue, unless there are concerns about hypertension and weight gain, the drug can be obtained using an electronic prescription. Progestin injection users are advised to switch to POP temporarily. New Implant and IUD services may be delayed due to the need for face-to-face contact. In the meantime, the acceptors will be offered oral contraceptives while waiting to be inserted when the situation allows. As for implant and IUD replacement services, it can be recommended to extend their use for at least the next 1 year. The effectiveness of the Cu IUD is still quite effective for up to 12 years, the LNG IUD for up to 6 years, and the LNG Implant for up to 4 years.[4,5]

Contraceptive problems during the Covid-19 Pandemic, especially regarding family planning services, prolongation of the use of Long-acting Reversible Contraceptive Methods (LARC), drug interactions, and the risk of thromboembolism, are very important, especially on the issue of ensuring proper contraceptive use during the Covid-19 period. Special attention needs to be paid to acceptors, health service providers, policymakers and the public to consider sexual and reproductive health services as priorities during this pandemic.[6]

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Research Article

Maternal Deaths due to Obstetric Hemorrhage in Padang, Indonesia: A Case-Control Study

Kematian Maternal Akibat Perdarahan Obstetri di Kota Padang, Indonesia: Sebuah Studi Kasus-Kontrol

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Abstract

Objective: To analyse the association between determinants of maternal deaths and obstetric haemorrhage in Padang, Indonesia.

Methods: A retrospective case-control study was conducted in Padang, Indonesia from 2015 to 2019. Maternal deaths that occurred due to obstetric haemorrhage in Padang Health Department was compared to three mothers who survived from obstetric haemorrhage (controls) in Dr. M. Djamil General Hospital, Padang, Indonesia.

Results: There were 20 deaths caused by obstetric haemorrhage during 2015 to 2019. Death records could only be found in 16 cases. The most common aetiology of obstetric haemorrhage was uterine atony (62.5%). Determinants associated with maternal deaths due to obstetric haemorrhage were interval between pregnancies (p=0.045; OR:10.846), history of previous labour (p=0.003; OR:8.556), and antenatal care (p=0.003; OR:21.364). Age, parity, birth attendant, and mother's educational level were not significantly associated with maternal deaths due to obstetric hemorrhage.

Conclusions: Uterine atony was the most frequent aetiology of maternal deaths due to obstetric haemorrhage. There was a significant association between pregnancy intervals, history of previous labour, and antenatal care with maternal deaths due to obstetric haemorrhage.

Keywords: determinant, obstetric haemorrhage, maternal death.

Abstrak

Tujuan: *Menganalisis hubungan determinan kematian maternal akibat perdarahan obstetri di Kota Padang.*

Metode: *Sebuah studi retrospektif case-control dilakukan di Kota Padang dari tahun 2015–2019. Setiap kasus kematian ibu akibat perdarahan obstetri dari tahun 2015–2019 yang dilaporkan oleh Dinas Kesehatan Kota Padang dibandingkan dengan tiga kasus perdarahan obstetri yang tidak berakibat kematian di RSUP Dr. M. Djamil Padang. Analisis data menggunakan uji Chi-square.*

Hasil: *Ada 20 kasus kematian akibat perdarahan obstetri selama tahun 2015–2019. Catatan kematian hanya dapat diperoleh pada 16 kasus. Etiologi terbanyak kematian akibat perdarahan obstetri ialah atonia uteri. Determinan yang berhubungan dengan kematian akibat perdarahan obstetri ialah jarak kehamilan (p=0.045; OR:10.846), riwayat persalinan sebelumnya (p=0.003; OR:8.556), dan antenatal care (p=0.003; OR:21.364). Tidak terdapat hubungan yang signifikan antara usia, paritas, penolong persalinan, dan tingkat pendidikan ibu dengan kematian maternal akibat perdarahan obstetri.*

Kesimpulan: *Atonia uteri merupakan etiologi tertinggi kematian maternal akibat perdarahan obstetri. Ada hubungan yang signifikan antara jarak kehamilan, riwayat persalinan sebelumnya, dan antenatal care dengan kematian maternal akibat perdarahan obstetri.*

Kata kunci: *determinan, kematian maternal, perdarahan obstetri.*

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INTRODUCTION

Obstetric haemorrhage is the major cause of maternal death globally, responsible for about 27.1% of all maternal mortality.[1] It causes 127,000 deaths annually and mainly occurs in developing countries.[2] In Southeast Asia, obstetric haemorrhage-related maternal deaths represented 29.9% of all maternal deaths.[1] Approximately 32% of all maternal deaths due to obstetric haemorrhage occurs in Indonesia and is the primary cause of maternal death during 2010–2013.[3] The primary causes of maternal death in Padang, Indonesia from 2015 to 2019 were obstetric haemorrhage (28%).[4–6]

The most common aetiologies of obstetric haemorrhage included first trimester bleeding, antepartum haemorrhage (APH), and postpartum haemorrhage (PPH). The first trimester bleeding is a common complication in pregnancy. It is estimated that 11 to 13% of all maternal deaths are caused by abortion and 6% are caused by ectopic pregnancy.[7] APH is present in 3 to 5% of pregnancies; such condition is of tend caused by placenta praevia, placental abruption, and uterine rupture.[8] Aetiologies of PPH include uterine atony, retained placenta, genital tract laceration, and coagulopathy.[9] Approximately two-thirds of obstetric haemorrhage-related maternal deaths are classified as postpartum haemorrhage.[1]

Despite the identification of risk factors, obstetric haemorrhage is mostly unpredictable. A comprehensive understanding of the determinants related to maternal death due to obstetric haemorrhage will help medical professionals quickly identify and provide adequate care for women at the greatest risk of dying. No earlier studies, to our knowledge, have directly addressed this topic. Considering the above explanation, we are interested in doing this study.

METHODS

This was a retrospective case-control study conducted at the Padang Health Department, Padang, Indonesia, first-line health care facilities around Padang, and Dr. M. Djamil General Hospital, Padang, Indonesia during the period of May to August 2020. The inclusion criteria were all mothers who died due to obstetric haemorrhage during 2015–2019 and were documented in Padang City Health Department. Mothers who survived from obstetric hemorrhage during 2015 to 2019 in Dr. M. Djamil General Hospital as controls. Uncompleted records were excluded from this study. Samples were collected by total sampling (cases) and systematic sampling (controls). Authors compared one case to three controls, matching with the etiology of hemorrhage.

Data were analysed by Chi-square test to find out the association between age, parity, interval between pregnancies, history of previous labour, antenatal care, birth attendant, and mother's educational level with maternal death due to obstetric haemorrhage. Data were analysed with SPSS 25.0 for Windows. P values less than 0.05 were considered statistically significant.

Table 1. Characteristics of Maternal Deaths due Obstetric Haemorrhage

Variables	Case		Control	
	n = 16	%	n = 48	%
Age (yo)				
In risk (<20 or >35)	4	23.5	13	76.5
Not in risk (20-35)	12	25.5	35	74.5
Parity				
In risk (1 or >4)	3	20	12	80
Not in risk (2-4)	13	26.5	36	73.5
Interval between pregnancies (years)				
In risk (<2)	3	75	1	25
Not in risk (≥2)	13	21.7	47	78.3
History of previous labour				
Spontaneous delivery	9	16.9	44	83.1
Cesarean and instrumental delivery	7	63.6	4	36.4
Antenatal care (times)				
In risk (<4)	5	83.3	1	16.7
Not in risk (≥4)	11	18.9	47	81.1
Birth attendant				
Healthcare worker	15	23.8	48	76.2
Non-healthcare worker	1	100	0	0.0
Mother's educational level				
Uneducated	1	100	0	0.0
Primary or secondary school	1	8.3	11	91.7
High school	10	28.6	25	71.4
Diploma or university	4	25	12	75

Table 2. The Etiology of Hemorrhage in Death Cases

Etiology of hemorrhage	n	%
Uterine rupture	1	6.25
Uterine atony	10	62.5
Retained placenta	4	25.0
Genital tract laceration	1	6.25

Table 3. The Association between Determinants and Maternal Death due to Obstetric Haemorrhage

Variables	Case		Control		*P-value*	OR	CI = 95%
	n	%	n2	%			
Age (yo)					1.000	0.897	0.245-3.288
In risk (<20 or >35)	4	23.5	13	76.5			
Not in risk (20-35)	12	25.5	35	74.5			
Parity					0.742	0.692	0.168-2.850
In risk (1 or >4)	3	20	12	80			
Not in risk (2-4)	13	26.5	36	73.5			
Interval between pregnancies (years)					0.045	10.846	1.040-113.165
In risk (<2)	3	75	1	25			
Not in risk (≥2)	13	21.7	47	78.3			
History of previous labour					0.003	8.556	2.063-35.481
Spontaneous delivery	9	16.9	44	83.1			
Cesarean and instrumental delivery	7	63.6	4	36.4			
Antenatal care (times)					0.003	21.364	2.263-201.712
In risk (<4)	5	83.3	1	16.7			
Not in risk (≥4)	11	18.9	47	81.1			
Birth attendant					0.250	0.238	0.153-0.370
Healthcare worker	15	23.8	48	76.2			
Non-healthcare worker	1	100	0	0.0			
Mother's educational level					0.171		
Uneducated	1	100	0	0.0			
Primary or secondary school	1	8.3	11	91.7			
High school	10	28.6	25	71.4			
Diploma or university	4	25	12	75			

There were 20 cases of maternal death due to obstetric hemorrhage in Padang City during 2015–2019. Death records could only be found in 16 cases. The characteristics are shown in Table 1. Maternal deaths most frequently occur at age 20-35 years (25.5%), multiparity (26.5%), short pregnancy intervals (75%), history of caesarean delivery (63.6%), poor antenatal care (83.3%), delivery assisted by a non-healthcare worker (100%), and uneducated (100%) when compared to mothers who survived from obstetric hemorrhage. In this study, we found that PPH is the main cause of maternal death due to obstetric hemorrhage with uterine atony as the highest etiology (62,5%). Determinants associated with maternal deaths due to obstetric haemorrhage were interval between pregnancies ($p = 0.045$), history of previous labour ($p = 0.003$), and antenatal care ($p = 0.003$). Age, parity, birth attendant, and mother's educational level were not significantly associated.

DISCUSSION

In this study, PPH was the major cause of maternal death due to obstetric hemorrhage, with uterine atony as the most frequent aetiology (62.5%). This finding is in line with a study in Madagascar and Turkey that showed 70.2% and 50.68% of all deaths due to haemorrhage were caused by uterine atony, respectively.[10,11] However, previous studies have shown varying results. In North-East India, uterine atony only occurs in around 15.98% of females.[12]

This study found that pregnancy intervals, history of previous labour, and antenatal care were significantly associated with maternal deaths due to hemorrhage. Short pregnancy intervals (<2 years) tends to increase the risk of death. The study in Nigeria and dr. Soesilo Slawi Hospital Tegal are showing the same result.[13,14] Short pregnancy intervals (<2 years) was classified as risk interval for reproductive organs due to insufficient rest periods.[13] Short pregnancy intervals is related to the decrease of maternal nutrition, thus increasing the possibility of hemoglobin level drop during labour. Existing literature has shown that severe anaemia may affect the contraction of myometrium due to diminished transport of oxygen and hemoglobin to the uterus affecting tissue enzyme and cellular dysfunction.[15]

Prior history of cesarean delivery increased the risk of death in our study. This result is similiar to findings in previous studies in Madagascar, Senegal, and Mali.[11,16] Indications for cesarean section are already risk factors for hemorrhage from delivery.[11] Another literature finds that caesarian delivery caused greater amount of blood loss compared to spontaneous delivery. In caesarian delivery, diagnosis and prevention to further blood loss are needed, so that danger to mother's life can be averted. In order to reduce PPH and its related complications, the International Confederation of Midwives and International Federation of Obstetrics and Gynecology (FIGO) suggest active management of the third stage of labour to all parturients.[17]

Poor antenatal check-up (less than 4 times) tends to increase the risk of maternal death due to obstetric hemorrhage. Our study is in India and Madagascar.[18,11] Women who had routine antenatal check-ups can identify the risk factors of pregnancy such as age, parity, pregnancy intervals, anemia status, history of illness, previous labour history, and PPH history. The place of delivery needs to be discussed and planned according to the risk of PPH identified during antenatal care. Antenatal care could optimize the management of chronic diseases such as cardiovascular disease, which could restrict the capacity of a woman to withstand acute blood loss. Daily or weekly supplementation of oral iron with or without folic acid in pregnant women decreases the risk of anaemia at term.[19]

Maternal age was not significantly associated with maternal deaths due to hemorrhage. Our study found that women who died in productive age (20-35 years) had pre-existing anaemia and chronic energy deficiency. An emergency hysterectomy is required for dead women suffering from anaemia and severe uterine atony. However certain studies have stated advanced maternal age (≥35 years) increases the risk of obstetric complications including PPH[20] and eventually leading to death.[16]

There was no significant association between parity and maternal deaths due to haemorrhage. We found that women who died with high parity were also followed by advanced maternal age, short pregnancy intervals, and rarely had antenatal care because of their mindset of being "experienced" based on previous pregnancy and having no symptoms on current pregnancy. This study found that high parity is related to low socioeconomic status. Our study is in concordance [16,10] but the study conducted showed otherwise.[11]

We did not find any significant association

between the birth attendant and maternal deaths due to hemorrhage. The present study found almost all deliveries of dead women who were already in high-risk pregnancy and severe conditions assisted by healthcare workers. However, there was a case of death who had home delivery and was assisted by family. Studies have indicated that home delivery[18] and unskilled birth attendants[21] are determinants leading to maternal death.

Lack of education of mothers was not found to be of any significant role in maternal survival which has also been observed [18] However, their study showed that mothers and mother in-laws play a crucial role in decision making related to maternal well-being and husbands lack of education was reflected as an important determinant of maternal survival.[18]

CONCLUSIONS

The present study reports maternal deaths due to obstetric haemorrhage are most frequently found in women at age 20-35 years, multiparity, short pregnancy intervals, history of cesarean delivery, poor antenatal care, delivery assisted by non-healthcare worker, and uneducated when compared to women who survived from obstetric hemorrhage. Uterine atony is the highest etiology of hemorrhage in death women. Significantly associated determinants are interval between pregnancies, history of previous labour, and antenatal care.

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Research Article

Maternal Mortality Rate before and after BPJS Health services Era

Angka Kematian Ibu sebelum dan sesudah Era BPJS

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Abstract

Objective: To compare maternal death in RSUD dr. Aloei Saboe Gorontalo before BPJS (in 2011-2013) and after BPJS (2014-2016)

Methods: Descriptive Retrospective. Data in this study obtained from the secondary data. This data obtained by the researcher from medical records in RSUD Prof. Dr. Aloei Saboe Gorontalo.

Result: In this study, the number of delivery in hospitals Prof. Dr. Aloei Saboe before BPJS (2011-2013) of 7906 deliveries of live births after 7735 and health services BPJS (years 2014-2016) of 6493 deliveries of live births BPJS 6333. Maternal mortality before and after as many as 34 cases BPJS many as 42 cases, so we get the MMR before BPJS 4.39 ‰ and 6.63 ‰ after BPJS.

Conclusions: There is a significant increase in maternal mortality rate in Prof. Dr. Aloei Saboe Gorontalo (p = 0.036), after BPJS maternal mortality (years 2014-2016) was 42 cases, compared with a prior health services BPJS (2011-2013) was 34 cases. This increase occurred because of a referral system BPJS make the decreasing number of births was in the hospital decreased, and hospitals Prof. Dr. Aloei Saboe a referral centre in Gorontalo province and surrounding areas.

Keywords: death, BPJS, maternal, mortality.

Abstrak

Tujuan: *Untuk membandingkan kematian maternal di RSUD Prof. Dr. Aloei Saboe sebelum BPJS (2011-2013) dan sesudah layanan kesehatan BPJS (2014-2016).*

Metode: *Deskriptif Retrospektif. Jenis data yang digunakan dalam penelitian ini adalah data sekunder yang diperoleh dari rekam medik di RSUD Prof. Dr. Aloei Saboe Gorontalo.*

Hasil: *Pada penelitian ini didapatkan jumlah persalinan di RSUD Prof. Dr. Aloei Saboe sebelum BPJS (2011-2013) sebanyak 7906 persalinan dengan kelahiran hidup 7735 dan sesudah layanan kesehatan BPJS (2014-2016) sebanyak 6493 persalinan dengan kelahiran hidup 6333. Kematian maternal sebelum BPJS sebanyak 34 kasus dan sesudah BPJS sebanyak 42 kasus, sehingga didapatkan AKI sebelum BPJS 4.39 ‰ dan sesudah BPJS 6.63 ‰.*

Kesimpulan: *Ternyata terdapat peningkatan yang bermakna (p=0,036) kematian maternal sesudah BPJS (2014-2016) sebanyak 42 kasus, bila dibandingkan dengan sebelum layanan kesehatan BPJS (2011-2013) sebanyak 34 kasus. Peningkatan ini terjadi karena sistem rujukan BPJS membuat menurunnya jumlah persalinan yang ada dirumah sakit menurun, dan RSUD Prof. Dr. Aloei Saboe merupakan pusat rujukan di propinsi Gorontalo dan sekitarnya.*

Kata kunci: *BPJS, kematian, maternal, mortalitas.*

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INTRODUCTION

Maternal mortality is a woman's death that occurs during pregnancy, childbirth up to 42 days after the end of pregnancy, regardless of age and location. According to the order of causes of maternal death, there can be 2 possibilities, namely; Pregnancy and childbirth cause complications in pregnant women, so that the pregnant woman dies, before pregnancy a woman already has a disease/health problem, then pregnancy, childbirth and childbirth which can worsen the health condition/disease, so that women die. The high and low maternal mortality rate in an area is often used as an indicator (benchmark) that describes the magnitude of health problems (diseases), the quality of health services and resources in an area. Also, the maternal mortality rate is the main indicator by the international community in determining a country's Human Development Index (HDI).[1]

One model of analysis of the factors that

determine the causes of maternal death includes; distant factors, namely socio-economic and cultural factors, intermediate factors consisting of health status and utilization of health services, Outcome factors, including pregnancy, complications and death factors.[2]

Maternal mortality is a complex problem caused by various causes which can be distinguished into near, intermediate, and far determinants. Close determinants that are directly related to maternal mortality are obstetric disorders, intermediate determinants related to health factors, such as maternal health status, reproductive status, access to health services and the behavior of using health facilities as well as distant determinants related to demographic and sociocultural factors.[3,4]

According to the World Health Organization (WHO) in 2011 the Maternal Mortality Rate (MMR) in Southeast Asian countries such as Malaysia is 29 per 100,000 live births, Thailand 48 per 100,000 live births, Vietnam 59 per 100,000 live births and Singapore 3 per 100,000 live births.[1] According to the Indonesian Demographic and Health Survey (SKDI) in 2012, the MMR in Indonesia had increased from 228 per 100,000 live births to 359 per 100,000 live births. This shows that Indonesia is still failing in developing the world of health because it has not been able to achieve one of the Millennium Development Goals (MDGs) targets. It is feared that in 2015 Indonesia will not be able to achieve the MDGs target of reducing MMR 102 / 100.00 live births. As of January 1, 2014, in accordance with Law no. 24 of 2011 concerning the Social Security Administration (BPSJ) began operating, where PT Askes Indonesia was changed to BPJS. With this tiered referral system, it has an impact on service quality and public health.[5,6]

To compare maternal mortality in Prof. Dr. Aloei Saboe before BPJS health services (2011-2013) and after BPJS health services (2014-2016).

METHODS

This research is a retrospective descriptive study in Prof. Dr. Aloei Saboe Gorontalo regarding maternal mortality before BPJS health services (2011-2013) and after BPJS health services (2014-2016). The results obtained were data processing using the 2-group proportion test and the X2 test.

RESULTS

From the results of research conducted at Prof. Dr. Aloei Saboe Gorontalo by looking at medical records as secondary data, obtained 7906 deliveries before BPJS health services (2011-2013) and 6493 deliveries after BPJS health services (2014-2016), while the number of live births before BPJS health services (2011- 2013) as many as 7735 deliveries and after BPJS health services (2014-2016) as many as 6333 deliveries.

Table 1. Characteristics of Maternal Mortality before BPJS Health Services (2011- 2013) and after BPJS Health Services (2014-2016)

Characteristics	before BPJS		after BPJS	
	N	%	N	%
Age				
< 20	3	8.82	2	4.76
20-34	24	70.59	32	76.19
> 35	7	20.59	8	19.05
Parities				
1	6	17.65	13	30.95
2-4	26	76.47	27	64.29
> 5	2	5.88	2	4.76
Education				
No School	4	11.76	3	7.14
SD	11	32.35	13	30.96
SLTP	13	38.24	14	33.33
SLTA	5	14.71	10	23.81
University	1	2.94	2	4.76
ANC (x)				
Never	19	55.88	28	66.67
1 – 3	9	26.47	6	14.29
> 4	6	17.65	8	19.04

Table 2. Causes of Maternal Deaths before BPJS Health Services (2011-2013) and after BPJS Health Services (2014-2016)

Causes of maternal death	before BPJS		after BPJS	
	N	%	N	%
Eclampsia	14	41.18	18	42.86
Cardiovascular diseases	5	14.71	6	14.29
PPH	7	20.59	3	7.14
Septic	4	11.76	11	26.19
Aspiration	1	2.94	0	0.0
Placenta Previa	1	2.94	1	2.38
Peritonitis	1	2.94	0	0.0
HIV	1	2.94	0	0.0
DHF	0	0.0	1	2.38
Embolization	0	0.0	1	2.38
Meningitis	0	0.0	1	2.38
Total	34	100	42	100

The most common cause of maternal death before and after BPJS was eclampsia, respectively, with 14 cases (41.18%) and 18 cases (42.86%).

Table 3. Length of Stay in Hospital until the Patient Dies before Health Services BPJS (2011-2013) and after BPJS Health Services (2014-2016)

Time	before BPJS		after BPJS	
	N	%	N	%
< 3	16	47.06	7	16.67
3-48	13	38.24	30	71.43
> 48	5	14.70	5	11.90
Total	34	100	42	100

X^2=10.131 (P=0.006)

Length of stay in the hospital until the patient died before BPJS was mostly in the length of treatment <3 hours as many as 16 cases (47.06%), while after BPJS the most was in the length of treatment for 3-48 hours as many as 30 cases (71.43%).

Table 4. Maternal Mortality before BPJS Health Services (2011-2013) after BPJS Services (2014-2016)

Year	Alive	Maternal Death	MMR (‰)
Before BPJS 2011 - 2013	7735	34	4.39
After BPJS 2014 - 2016	6333	42	6.63

*Z=-1.800 (p = 0.036)**

There were 34 cases of maternal mortality before BPJS service (4.39 ‰) compared to 42 cases (6.63 ‰) after BPJS, there was a significant increase (p = 0.036).

DISCUSSION

Based on the data obtained in this study, it was found that there was an increase in maternal mortality in Prof. Dr. Aloei Saboe Gorontalo after the start of BPJS health services. For this reason, it needs to be criticized and evaluated so that there is an increase in better servants.

With the tiered referral system in BPJS health services, we are starting to empower level 1 health facilities again. This tiered referral system has advantages and disadvantages that need to be examined further. In this referral system, level I health facilities are the spearhead for conducting diagnosis and handling of obstetric cases. In this study, evaluating the length of treatment for patients until death, there was a decrease in the number of patients who died in less than 3 hours after the patient arrived at the hospital.[6–8]

The number of deliveries at Prof. Dr. Aloei Saboe before the start of BPJS health services (2011-2013) totalled 7906 and after BPJS health services (2014-2016) totalled 6493. The number of deliveries decreased due to BPJS health services being implemented in a structured and tiered manner, where obstetric cases should be served level I health facilities such as primary health care, while the number of maternal deaths in 2011-2013 was 34 people and in 2014-2016 there were 42 people.

Based on the data above, the referral or the way the patient was admitted to the hospital before the BPJS health service stated that the patients came alone without a referral as many as 15 people (44.1%), while after BPJS patients who came without a referral were 6 (14.3%). This is because the obstetric referral system is a part of health efforts that fall within the scope of the national health system which aims to improve health services and the welfare of mothers and children.[9] Referrals relate to the arrival of the patient to the place where health services are carried out, in this case, in the form of community health centre, doctor's practice and hospital. Implementation of referrals, in this case, the referral time according to operational standards, can help early management in this case of obstetrics.[8] In emergency cases, immediate treatment is needed, in this BPJS health service the referral system is considered very important and very helpful for emergency cases to get first treatment in the surrounding area or health facility then it is decided to be referred to the hospital.[10] Patients who were admitted to the hospital with the most causes of maternal death were eclampsia in the pre-BPJS era, 14 people (38.9%) and 17 BPJS health services (40.5%). According to research conducted by Ghulmiyyah in 2012, eclampsia increases the risk of maternal death in developing countries. The high maternal mortality occurs especially in patients who experience multiple seizures outside the hospital without prompt treatment.[9,11]

Overall maternal mortality can be caused by the low level of public awareness about the health of pregnant women, although there are still many factors that must be considered in dealing with this problem.[12] Common problems of death are indications of bleeding, eclampsia, infection and other diseases. In these cases, it is very important to be able to recognize the risk factors that exist in a level I health facility, so that patients at high risk can be diagnosed and treated early for their emergency. For this reason, it is necessary to improve training and existing facilities at the level I health facilities so that they can diagnose and handle emergency cases so that patients get

good first aid so that the condition when they are referred is in a state that has received medical help and reduces the mortality rate.[13,14]

CONCLUSION

Based on data on maternal mortality at BPJS health services for 3 years, compared to before BPJS health services, there was an increase with the average value of maternal mortality before BPJS 34 (4.39 ‰) increasing to 42 (6.63 ‰) after BPJS.

BPJS health services are only a system of dam programs managed by health experts and can be improved for the welfare of the Indonesian people. Health facilities and service providers need to be considered so that appropriate treatment is given at level I health facilities and level I facilities can continue to develop. BPJS must also take part in improving health facilities and developing medical science in Indonesia.

SUGGESTION

It is necessary to evaluate the referrals that come to find out whether this referral system can help reduce maternal mortality or just lengthen the flow so that patients get help late. It is also necessary to evaluate and compare maternal deaths on a wider scale to get a bigger picture of the impact of BPJS health services on maternal death cases. The BPJS health service system needs to be reviewed from various points of view so that the improvement of Indonesian public health services becomes real.

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Research Article

Vaginal pH of Menopausal Women is Related to the Duration of Menopause

Keasaman Vagina Perempuan Menopause Berhubungan dengan Lamanya Menopause

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Abstract

Objective: To determine the correlation between vaginal pH in menopausal women with the age and duration of menopause.

Methods: This was a descriptive-analytic study conducted on 32 menopausal women in the obstetrics and gynaecology department of a teaching hospital in Kendari, Southeast Sulawesi. The data collection used a questionnaire comprising sociodemographic data, history of menstruation, menopausal symptoms, and medication. Measurement of vaginal pH was using a pH strip. We carried the interpretation out by matching the colour change on the strip with the rating indicator on a calorimetric scale. Statistical analysis used the Chi-square test with a significance level of $p < 0.05$.

Result: Most respondents were 50-55 years old. The majority of menopausal ages were 52 years, and the mean age of menopause was 50.31 ± 2.63 years. Vaginal pH ≥6 was found at>55 years (66.7%), menopausal age <50 years (58.8%), and duration of menopause >2 years (82.4%). There was no relationship between women's age and menopausal age with vaginal pH ($p = 0.701$ and $p = 0.732$). There was a relationship between the duration of menopause and vaginal pH ($p = 0.002$).

Conclusions: The vaginal pH of menopausal women is related to the duration of menopause. Vaginal pH≥ 6 can be used as an alternative indicator to determine the duration of menopause.

Keywords: duration of menopause, menopause, vaginal pH.

Abstrak

Tujuan: *Mengetahui hubungan antara pH vagina pada perempuan menopause dengan usia dan lamanya menopause.*

Metode: *Penelitian ini bersifat deskriptif analitik, dilakukan pada 32 perempuan menopause di Poliklinik Obstetri dan Ginekologi Rumah Sakit Pendidikan di Kendari, Sulawesi Tenggara. Pengumpulan data menggunakan kuesioner, terdiri dari data sosiodemografi, riwayat haid, gejala menopause, dan pengobatan. Pemeriksaan pH vagina menggunakan strip pH. Interpretasi hasil dilakukan dengan membandingkan perubahan warna yang terbentuk pada strip dengan indicator penilaian pada skala kalorimetrik. Analisis statistic menggunakan uji Chi-square dengan tingkat kemaknaan p< 0,05.*

Hasil: *Mayoritas responden berusia 50-55 tahun. Sebagian besar mengalami menopause pada usia 52 tahun, dengan rerata usia menopause adalah 50.31±2.63 tahun. Kadar pH vagina ≥6 sebagian besar pada ibu yang berusia >55 tahun (66.7%), usia menopause <50 tahun (58.8%), dan lama menopause >2 tahun (82.4%). Tidak terdapat hubungan antara usia ibu dan usia menopause dengan pH vagina (p=0.701 dan p=0.732). Terdapat hubungan antara lamanya menopause dan pH vagina (p =0.002).*

Kesimpulan: *pH vagina perempuan menopause berhubungan dengan lamanya menopause. pH vagina ≥6 dapat menjadi petunjuk alternative untuk menentukan lamanya menopause.*

Kata kunci: *lama menopause, menopause, pH vagina.*

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INTRODUCTION

Symptoms of menopause can affect the physical, psychological, and quality of life of menopausal women.[1,2] During menopause, a woman experiences endocrine, somatic, and psychological changes. These changes can start before menstruation stops, and last for an average of 2 to 5 years.[3,4]

Currently, the management of menopausal symptoms is hormone replacement therapy, although estrogen has been reported to have long-term side effects.[5] Several studies on phytoestrogen, as natural estrogens derived from plants, have been carried out to treat menopausal symptoms.[6]The phytoestrogen can induce the proliferation and maturation of the epithelium on the vaginal surface, which plays an important role in the vagina's defence against pathogenic bacteria.[6,7]

Loss of estrogen production from the ovaries causes menopausal women to experience symptoms of atrophic vaginitis.[8] Estrogen deficiency results in changes in epithelial cell maturation so that the glycogen content will decrease.[9] A decrease in glycogen in the vagina epithelial of menopausal women causes an increase in the pH of the vagina to become more alkaline, which increases the risk of vaginal infection or atrophic vaginitis.[8,10] Glycogen is a source of nutrition for microorganisms in the vagina which metabolize and form lactic acid. Lactobacillus converts glycogen into lactic acid and produces an acidic pH in the vagina, inhibiting the growth of pathogenic bacteria.[11,12]

Currently, there is a lack of publication on factors related to vaginal acidity in menopausal women, especially those related to menopausal syndrome. Therefore, this study aimed to determine the relationship between vaginal acidity of menopausal women with the age and duration of menopause. So, it will provide basic information for the development of menopausal syndrome management.

METHODS

This was a descriptive-analytic study that has been carried out in the Obstetrics and Gynecology Department of the teaching hospital at Kendari, Southeast Sulawesi, in October 2020. A total of the respondents were 32 menopausal women. The inclusion criteria were having a uterus and signing an informed consent form. The exclusion criteria were taking antibiotics and drugs in the vagina within the last 24 hours, having sexual intercourse within 3 days, and having gynecological malignancy.

The instruments were questionnaires and pH strips. The questionnaire comprised sociodemographic data, menstrual history, menopausal symptoms, and medication. Measurement of vaginal pH was using a pH strip. We carried interpreting out by matching the colour change on the strip with the indicators on the calorimetric scale. Statistical analysis used the Chi-square test with a significance level of $p < 0.05$.

The ethical clearance had approved by the Health Ethics Commission of Faculty of Medicine, Universitas Halu Oleo.

RESULTS

This study was conducted on 32 respondents with the characteristics shown in table 1.

Table 1. Characteristics of Respondents

Characteristics	n	%
Age		
<50	5	15.6
50-55	18	56.3
>55	9	28.1
Occupation		
Housewife	16	50.0
Self-employees	3	9.4
Employees	13	40.6
Education levels		
Low	6	18.8
Middle	13	40.6
High	13	40.6
Parity		
<4	16	50.0
≥4	16	50.0

Most respondents in this study were aged 50-55 years (56.3%) and as housewives (50.0%). There were respondents with low education (18.8%), medium and high education (40.6% respectively). Respondents in this study have varying parity evenly. (See table 1).

Table 2. Mean of Women's Age, Age of Menopause, and Duration of Menopause

Characteristics	Minimum	Maximum	Mode	Mean±SD
Age	47	68	53	54.13±4.97
Age of menopause	46	55	52	50.31±2.63
Duration of menopause	1	11	1	3.34±2.72

In this study, the mean of women's age was 54.13 ± 4.97 years, the minimum age was 47 years and the maximum age was 68 years. Most respondents experienced menopause at 52 years, and the mean age of menopause was 50.31 ± 2.63 years. Some respondents experienced menopause at 46 years and 55 years. The mean duration of menopause in this study was 3.34 ± 2.72 years. (See table 2).

Table 2. Mean of Women's Age, Age of Menopause, and Duration of Menopause

Characteristics	pH				Total		*P-value*
	<6	%	≥6	%	n	%	
Age							
<50	2	40.0	3	60.0	5	15.6	
50-55	9	50.0	9	50.0	18	56.3	0.701
>55	3	33.3	6	66.7	9	28.1	
Age of menopause							
<50	7	41.2	10	58.8	17	53.1	0.730
≥50	7	46.7	8	53.3	15	46.9	
Duration of menopause							
≤2	11	73.3	4	26.7	15	46.9	0.002
>2	3	17.6	14	82.4	17	53.1	

In Table 3, vaginal pH≥ 6 was found at> 55 years (66.7%). The statistical test showed no relationship between women's age and vaginal pH (p = 0.701). The vaginal pH≥ 6 was found at menopausal age <50 years (58.8%), but statistically, there was no relationship between menopausal age and vaginal pH (p = 0.730). Based on the duration of menopause, vaginal pH≥ 6 was found in respondents with a duration of menopause> 2 years (82.4%). There was a relationship between the duration of menopause and vaginal pH (p = 0.002).

DISCUSSION

Menopause is characterized by the cessation of menstruation and decreased levels of estrogen because of loss of activity of ovarian follicles. Menopause begins at different ages around 50 years.[3] This study found that the mean age of menopause was 50.31 ± 2.63 years, with the majority experiencing it at 52 years. Several other studies found that the mean age of menopause was 47.8 ± 4.1[13] and 47.42 ± 3.64.[14]

Estrogen affects vaginal epithelial cells to synthesize and collect glycogen. Lactobacillus bacteria will metabolize glycogen into lactic acid which causes a low pH in the vagina, which is around 4.5.[15] Decreased estrogen levels cause vaginal epithelial thinning resulting in decreased lactobacilli colonization. This causes an increase in vaginal pH to become more alkaline.[16,17] In this study, a more alkaline vaginal pH was found at menopause conditions of over 2 years. There is a significant relationship between vaginal pH and the duration of menopause. Several menopausal symptoms occur because of hormonal changes during menopause. These changes start before menstruation stops, persisting for an average of 2 to 5 years.[3,4]

Vaginal pH is closely related to age and menopausal status. This study showed a more alkaline vaginal pH was obtained at age> 55 years, although statistically there was no relationship between age and vaginal pH. The vaginal pH value increases with age and indicates a vaginal pH> 6.00 can be used as a marker of menopausal status.[14]

This study found that vaginal pH> 6 was the majority at menopausal age <50 years, but statistically, there was no relationship between menopausal age and vaginal pH. A study reported that the sensitivity of vaginal pH to determine the diagnosis of menopause is 90% with a pH limit value> 4.5.[18] Another study reported that if there was no vaginitis, a vaginal pH> 4.5 indicated menopause with a sensitivity of 74%.[19]

CONCLUSION

Based on this study, we conclude that vaginal pH is related to the duration of menopause, so that vaginal pH> 6 can be used as an alternative method of determining the duration of menopause.

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Research Article

Chlamydia Trachomatis Infection and Spontaneous Abortion

Infeksi Chlamydia Trachomatis dan Abortus Spontan

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Abstract

Objective: To determine the correlation between spontaneous abortion and *Chlamydia trachomatis* infection.

Methods: A cross-sectional study was conducted in women who experienced spontaneous abortion. Normal pregnancies with gestational age ≥37 weeks as control. Detection of C. trachomatis in the product of conception or placenta from curettage using the PCR method.

Results: Positive C. trachomatis was found 3 cases in the abortion group and 4 cases in control. In the abortion group, C. trachomatis found in 1 case with vaginal discharge history and 2 cases without this history. C. trachomatis also found in 3 cases without a history of abortion. This bacteria was not found in patients with an abortion history. In the control group, 2 cases of positive C. trachomatis were found in pregnant women with or without a history of vaginal discharge and abortion, respectively. There were no significant differences regarding the positive of C. trachomatis between the two study groups regarding history of vaginal discharge and abortion.

Conclusions: Spontaneous abortion does not correlate with C. trachomatis infection.

Keywords: chlamydia trachomatis, infection, spontaneous abortion.

Abstrak

Tujuan: *Untuk mengetahui hubungan antara abortus spontan dan infeksi Chlamydia trachomatis.*

Metode: *Penelitian potong lintang dilakukan pada perempuan yang mengalami abortus spontan. Kehamilan normal dengan usia kehamilan ≥37 minggu sebagai kontrol. Deteksi C. trachomatis pada produk konsepsi atau plasenta dari kuretase menggunakan metode PCR.*

Hasil: *C. trachomatis positif ditemukan 3 kasus pada kelompok aborsi dan 4 kasus dalam kontrol. Pada kelompok abortus spontan, C. trachomatis ditemukan pada 1 kasus dengan riwayat keputihan dan 2 kasus tanpa riwayat keputihan. C. trachomatis juga ditemukan pada 3 kasus tanpa riwayat abortus. Bakteri ini tidak ditemukan pada pasien dengan riwayat abortus. Pada kelompok kontrol, 2 kasus positif C. trachomatis masing-masing ditemukan pada perempuan hamil dengan atau tanpa riwayat keputihan dan abortus. Tidak ada perbedaan signifikan C. trachomatis positif antara kedua kelompok penelitian berdasarkan riwayat keputihan dan abortus.*

Kesimpulan: *Abortus spontan tidak berkorelasi dengan infeksi C. trachomatis.*

Kata kunci: *abortus spontan, chlamydia trachomatis, infeksi.*

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INTRODUCTION

Chlamydia trachomatis is the most common cause of sexually transmitted infections. The prevalence of this bacteria in women aged 15-49 years based on the region of 5.1 million (2.6%) in Africa, 5 million (1.1%) in Southeast Asia, and 20.5 million (4.3%) in the West Pacific.[1] This bacterial infection in pregnant women is asymptomatic; thereby, increasing the risk of adverse pregnancy outcomes. Infection during pregnancy is a risk factor for abortion (termination of spontaneous pregnancy before a gestational age of 24 weeks), fetal death at gestational age ≥28 weeks and preterm birth through direct infection at fetal, placental damage and severe maternal disease.[2]

A high prevalence of C. trachomatis infection in spontaneous abortion or recurrent abortion has been reported.[3-5] C. trachomatis persistent infection is determined by serum IgA levels

against the main membrane outer protein of this bacterium.[6] The correlation between abortion and chlamydial infection is demonstrated through anti-chlamydia antibodies IgG and IgA and detection of chlamydial antigens/DNA from the product of conception and placental.[7-9] However, the inability to detect IgM or to isolate C. trachomatis from seropositive patients indicated that Chlamydia species are not directly related to abortion.[4] A small meta-analysis from 4 studies shows an association between C. trachomatis infection and abortion.[10] This study aims to determine the correlation between spontaneous abortion and C. trachomatis infection.

METHODS

A cross-sectional study was conducted on women who experienced spontaneous abortion in several hospitals in Makassar. A normal pregnancy with gestational age ≥37 weeks as control. Detection of C. trachomatis in the product of conception or placenta from curettage using the PCR method. A p-value <.05 were considered statistically significant. The study approved by the Medical Research Ethics Committee of Universitas Hasanuddin /Dr. Wahidin Sudirohusodo General Hospital.

RESULTS

Table 1. Patients characteristics

Characteristics	Spontaneous abortion (n=42)		Control (n=42)		*P-value*
	n	%	n	%	
Age (yo)					
<20	5	11.9	7	16.7	0.802
20-35	31	73.8	30	71.4	
>35	6	14.3	5	11.9	
Education (years)					
<9	6	14.3	5	11.9	1.000
≥9	36	85.7	37	88.1	
Occupation					
Working	22	52.4	15	35.7	0.187
Not working	20	47.1	27	64.3	

Table 2. PCR Results on C. Trachomatis Infection

Study groups	PCR +		PCR -		*P-value*
	n	%	n	%	
Spontaneous abortion (N=42)	3	7.1	39	92.9	0.697
Control (N=42)	4	9.5	38	90.5	

Table 3. C. Trachomatis Infection Based on Vaginal Discharge and Abortion History

History	Spontaneous abortion (n%)		*P-value*	Control (n%)		*P-value*
	PCR (+)	PCR (-)		PCR (+)	PCR (-)	
Vaginal discharge						
Positive	1(11.1)	8(88.9)	0.525	2(20)	8(80)	0.236
Negative	2(6.1)	31(93.9)		2(6.2)	30(93.8)	
Abortion						
Yes	0 (0)	11(100)	0.554	2(13.3)	13(86.7)	0.608
No	3(9.7)	28(90.3)		2(7.4)	25(92.6)	

Positive C. trachomatis was found in 3 cases in the abortion group and 4 cases in control (Table 2). There was no significant difference between the two study groups (p>.05). Further findings in the abortion group, C. trachomatis found in 1 case with vaginal discharge history and 2 cases without this history. C. trachomatis also found in 3 cases without a history of abortion. Conversely, this bacteria was not found in patients with abortion history. There were no significant differences (p<.05) between the two histories in the abortion group. In the control group, 2 cases of positive C. trachomatis were found in pregnant women with or without a history of vaginal discharge and

abortion, respectively. There were no significant differences (all p>.05) regarding the positive of C. trachomatis between the two study groups based on a history of vaginal discharge and abortion (Table 3).

DISCUSSION

The present study found C. trachomatis infection detected in spontaneous abortion patients with or without vaginal discharge. These findings indicated that C. trachomatis infection has no correlation with vaginal discharge. Our findings that vaginal discharge was not correlated with C. trachomatis infection.[11] C. trachomatis is an intracellular bacterium with the ability to change from the form of replication that protects the host cell lead to the elimination of microbes more difficult. Infection caused by this bacteria often without clinical symptoms (asymptomatic); therefore, it is difficult to assess the spread of this infection.

In the present study, positive C. trachomatis was found both in spontaneous abortion and control groups, but the difference was not significant. Women with positive chlamydial serological tests are at risk for abortion and C. trachomatis DNA was present in the conception and placental products of these women compared to controls.9 Therefore, not all pregnant women who are detected to have C. trachomatis infection will experience an abortion. Therefore, the pregnancy can reach term accompanying by preventive management.

Vaginal discharge can be used to determine vaginal infections by C.trachomatis using vaginal discharge flowcharts with a sensitivity 91.68%, specificity 99.97% and positive predictive value (PPV) 99.93%.[12] Vaginal discharge is more commonly found as asymptomatic urogenital infection in 50% of patients.[11] In addition, vaginal discharge can be used as a symptomatic diagnosis of vaginal infections including C. trachomatis infection.[13]

Another finding of our study is abortion history has no statistically significant relationship with the incidence of C. trachomatis infection. However, the Kashanian study reported that spontaneous abortion history in the first pregnancy had a higher risk of having an abortion in the second pregnancy compared to women who had the first pregnancy with a live newborn.[14]

The limitation of this study is that women with positive C. trachomatis cannot be distinguished whether the infection is acute or chronic. The descriptive method with a small sample proportion is also limited to our study when compared with comparative analytic studies with a larger sample size. The present study variables do not represent the factors that influence chlamydial infection as one of the sexually transmitted diseases.

CONCLUSION

Spontaneous abortion does not correlate with Chlamydia trachomatis infection.

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Research Article

Does Knowledge Affect the Attitude of Fertile Aged Women in Visual Inspection with Acetic Acid Examination? A cross-sectional study

Apakah Pengetahuan Mempengaruhi Perilaku Wanita Berusia Subur pada Pemeriksaan Inspeksi Visual Asetat? Sebuah Studi Potong Lintang

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Abstract

Objective: To find out the relationship between knowledge and attitudes of fertile aged women with IVA examination behaviour at Bitung Barat Public Health Center in Bitung City.

Method: This was a cross-sectional study. Samples of 145 fertile aged women in area Bitung Barat Public Health Center Bitung city.

Results: Of the 145 respondents, the highest group had sufficient and good knowledge. The highest percentage is respondents who have sufficient knowledge with a percentage of 44.14%. The attitude towards the IVA examination was assessed as good as 122 people (84.14%). The number of respondents who did not do an IVA examination is 94 people (64.83%) more than respondents who did not do an IVA examination that is 51 people (35.17%). Based on the results of statistical tests it is known that the significance value of p = 0.000. The attitude of women of childbearing age is good then the behaviour of IVA examination is also good with the results of statistical tests known that the significance value p = 0.001.

Conclusions: Respondents with good IVA examination behaviour have good knowledge and attitude.

Keywords: attitude, behaviour, IVA examination, knowledge.

Abstrak

Tujuan: *Mengetahui hubungan antara pengetahuan dan sikap perempuan usia subur dengan perilaku pemeriksaan IVA di Puskesmas Bitung Barat Kota Bitung.*

Metode: *Metode penelitian berupa analitik observasional dengan rencangan potong lintang. Sampel sebesar 145 perempuan usia subur di wilayah Puskemas Bitung Barat Kota Bitung.*

Hasil: *Dari 145 responden, kelompok tertinggi memiliki pengetahuan yang cukup dan baik. Persentase tertinggi yaitu responden yang memiliki pengetahuan cukup dengan persentase 44,14%. Sikap terhadap pemeriksaan IVA dinilai baik yaitu sebanyak 122 orang (84,14%). Jumlah responden yang tidak melakukan pemeriksaan IVA yaitu 94 orang (64,83%) lebih banyak dari responden yang tidak melakukan pemeriksaan IVA yaitu 51 orang(35,17%). Berdasarkan hasil uji statistik diketahui bahwa nilai signifikansi p= 0,000. Sikap perempuan usia subur yang baik maka perilaku pemeriksaan IVA juga baik dengan hasil uji statistik diketahui bahwa nilai signifikansi p= 0,001.*

Kesimpulan: *Responden dangan perilaku pemeriksaan IVA yang baik memiliki pengetahuan dan sikap yang baik.*

Kata kunci: *pengetahuan, pemeriksaan IVA, perilaku, sikap..*

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INTRODUCTION

Until now, cervical cancer is still one of the most deadly cancers in women in the world. The incidence of cervical cancer shows that cervical cancer is a type of cancer in women who ranks fourth in the world. The incidence of cervical cancer was recorded as many as 527,624 women in the world or as much as 7.5 per cent of cancer sufferers in women in the world based on Global Cancer project data from the International Agency for Research on Cancer in 2012.[1-3] Types of cancer in women who rank first the most in the world, namely breast cancer followed by colorectal cancer, lung cancer and the fourth-highest number is cervical cancer. The mortality rate of all cervical cancer sufferers in the world is 265,672 women and the prevalence rate of 5 years of cervical cancer is 1,547,161 women.[1,4,5]

According to WHO and the International Cancer Control Union (UICC) predict in 2030 there will be a surge of 300% sufferers in the world and 70% of them in Indonesia up to 7 times. [4.6] Data from the Ministry of Health of the Republic of Indonesia in 2012 states, the incidence of cervical cancer is 17 per 100,000 where the estimated mortality rate in Indonesia for this cancer is 8.2 deaths per 100,000 population. This is estimated because about one-third of cancer cases, including cervical cancer, come to health services at an advanced stage.[7-9] Bitung City is one of the cities in North Sulawesi Province with a high incidence of cervical cancer, considering various risk factors for the incidence of cervical cancer are many. The various ways of preventing cervical cancer can be done at various levels of the facility. WHO uses a special approach to examine pre-cervical cervical cancer lesions so that prevention of uterine cancer becomes more effective, the speed of diagnosis to the prompt and proper handling. The examination that is considered simple in the early detection of cervical pre-cancerous lesions includes Pap Smear and Visual Acetate Acid Inspection (IVA) with various advantages and disadvantages of each.[10]

Acetic Acid Visual Inspection Examination (IVA) is an examination conducted to detect cervical pre-cancerous lesions in the "Cancer Prevention and Early Detection Movement for Women" carried out by the Ministry of Health of the Republic of Indonesia from 2015 to 2019. This activity aims generally to reduce morbidity and mortality due to breast cancer and cervical cancer as the most cancers suffered by women. It is hoped that this activity can improve early detection of cervical pre-cancerous lesions. This IVA examination is simple, easy, inexpensive, fast and can be done at a first-level health facility by midwives and doctors in health centres.[11] Based on diagnostic test results, IVA examination has a sensitivity of 84%, specificity of 89%, the positive predictive value of 87%, and the estimated negative value is 88% while the pap smear examination has a sensitivity of 55%, a specificity of 90%, a positive predictive value of 84%, and a negative predictive value of 69%, so from these results, it can be concluded that the IVA examination gives a faster sensitivity result. high.[12,13]

The cause that becomes an obstacle for women in conducting early detection of cervical cancer is a lack of knowledge and doubts about the importance of the examination, fear of pain and reluctance due to feelings of shame and anxiety when doing the examination, even as for fear because of fear of knowing if the woman was proven to suffer uterine cancer. Low awareness in the community is one of the factors that contribute to the high incidence of cervical cancer in Indonesia.[14]

The high death rate due to cancer, especially in Indonesia, is due, among others, to the limited knowledge of the community about the dangers of cancer, early signs of cancer, risk factors for cancer, how to treat them correctly, and habits to a healthy lifestyle.[15] About 87% of deaths from cervical cancer women are in developing countries including Indonesia. Every 1 minute 1 new case appears and every 2 minutes 1 woman dies due to cervical cancer.[1,2]

The City of Bitung is a port city where the activities of ship workers take turns changing both the local population, outside the region and from abroad. As for certain areas that provide sexual services both directly and indirectly around the port area. Several national and international articles write that sexual activity in the port area is considered high in status outside marital ties, this is related to the behaviour of ship workers, the economic needs of the community and the level of education. This is encouraging ung due to the availability of localization of commercial sex workers. Based on data from the Bitung city social service in 2017, of the 87 CSWs recorded there were dozens of them aged 12-17 years.[16,17]

Bitung City with an area of 31,350.35 Ha with a population of Bitung city based on the 2017 population projection of 212,409 people

with 48.92% of the population is women. The population density in the city of Bitung in 2017 reached 677 inhabitants / km2. There are 9 health centres in the city of Bitung and 3 hospitals. The number of health workers included 117 doctors, 44 of whom were expert doctors and 73 general practitioners. Recorded in 2017 as many as 306 nurses and 102 midwives spread across various health facilities in the city of Bitung. Maesa Subdistrict, the largest sub-district in the city of Bitung, is located in the centre of the city with an area that is mostly a shopping centre, entertainment centre and port.[12]

Data from the North Sulawesi Provincial Health Office in 2017 recorded an examination of Acetic Acid Visual Inspection (IVA) of 20,002 women with 422 of them being declared IVA positive. In North Sulawesi Province currently, the highest target of IVA examination is in Bitung City, which reaches 51% of the target number. In 2017 data from the Bitung City Health Office registered 16.170 women involved in the IVA examination which were considered quite successful. The 2016 IVA examination activity data in the city of Bitung where the districts with the most positive IVA results are in the Maesa sub-district, but the achievement of IVA examinations in women of childbearing age is only 1.47% of the number of women of childbearing age in the district.[12]

Several studies like this have been conducted in other areas, in Mojokerto, at the Buleleng Health Center-Bali, in Yogyakarta,) in the Tempuran hamlet Karawang District, West Java.[18-21] Based on the above background, the researcher is interested in conducting research on the relationship between the level of knowledge and attitudes of women of childbearing age to the behaviour of IVA examinations in the Bitung Barat Public Health Center in the Maesa district of Bitung.

METHODS

This study was an observational analytic study with a cross-sectional design. This research was conducted at the Bitung Barat Public Health Center in Maesa district, Bitung City. When the research will be conducted from October 2019 to December 2019.

The population in this study were women of childbearing age at the Bitung Barat Public Health Center in Maesa district, Bitung City. Based on calculations using a single proportion formula, 145 women of childbearing age were needed as samples in this study. All women aged 15-49 years old at the Bitung Barat Public Health Center in the City of Bitung.

In this study, the inclusion criteria in the form: population can read and write, and Willing to be a respondent, while the exclusion criteria in the form of women who have never had sexual intercourse, history or are suffering from psychiatric illnesses In this study, the dependent variable is in the form of Knowledge and attitudes, while the independent variable: IVA Examination Behavior.

In this study, there are operational limitations IVA or Acetic Acid Visual Inspection is a method of early detection of cervical precancerous lesions by applying 3-5% acetic acid liquid to the entire surface of the portio, waiting for 1 minute, then observed with the naked eye without any enlargement. What was observed was the presence of white spots (ace to white).

The level of education is divided into Basic Education: Initial education for 9 years, namely elementary school for 6 years and junior high school for 3 years Secondary Education: The level of further education in basic education is high school / vocational school for 3 years. Higher Education: Level of education after secondary education which includes diploma, bachelor, master, and doctoral education organized by tertiary institutions. Knowledge is the result of knowing that occurs after someone senses a certain object. Knowledge about IVA examination is what the respondent knows about the understanding, benefits, objectives and instructions of IVA examination. The assessment of the level of knowledge of IVA examination is divided into Good knowledge: if the respondent fills in a questionnaire with a level of> 75%, Knowledge is sufficient: if the respondent fills in the questionnaire with a 55-75% truth level, Less knowledge: if the respondent fills in the questionnaire with a truth level <55%

Attitudes namely the style, feelings and tendencies of reactions that are evaluative of the object at hand. For the assessment of attitude through filling out a questionnaire, with the division: Good attitude if the respondent answers with value> 50%, Bad attitude if the respondent answers with value <50%. The behaviour of an IVA examination is what is done by the respondent towards an IVA examination, assessment by conducting an IVA examination or not doing an IVA examination; Age is the age of the woman when the study was based on the last birthday,

Fertile Age Women are women aged 15-49 years.

The research instruments used were: informed consent sheet, questionnaire sheet.Procedure and stage of this research, This research was conducted on subjects who met the inclusion and exclusion criteria by being explained the research procedures to be carried out and their benefits. Prospective research subjects who are willing to take part in this research are asked to fill out and sign the informed consent form that has been provided. Research subjects fill out a research questionnaire Every subject included in this study is adjusted to the principles of research ethics, that is, every subject who meets the inclusion and exclusion criteria is first informed and counselled. If you agree to take part in this research, prospective subjects must sign an informed consent. This research was conducted with the approval of the Prof. RSUP Ethics Committee Dr. R. D. Kandou Manado, and permission from the Government and the Bitung City Health Office.

RESULTS

Research has been conducted on the relationship of knowledge and attitudes of women of childbearing age to the behaviour of IVA examinations in the Bitung Barat Public Health Center in the city of Bitung with a sample of 145 respondents. This research is an analytic observational study with a cross-sectional study design.

Data collection was carried out for women of childbearing age at the Bitung Barat Public Health Center who met the inclusion criteria and signed the consent letter. Respondents answered questionnaires representing questions to assess the level of knowledge, attitudes of respondents and IVA examination behaviour. The results of this study were carried out by analyzing the data to be used in this study, namely by analyzing the characteristics descriptively presented in the form of a frequency distribution. Data processing with SPSS version 20 and the results of the assessment of the level of knowledge and attitudes of the questionnaire to see the relationship of knowledge and attitudes of women of childbearing age to IVA examination behaviour by using a statistical test that is the X2 test (Chi-square).

General characteristics of women of childbearing age who are the subject of research include age, level of education, occupation, and whether the respondent has ever received information about IVA examinations.

Based on data from respondents, the distribution of respondents based on age found that the highest age group is above 35 years, which is 77 respondents (53.10%) and there are also 2 respondents aged under 20 years (1.38%). Based on the level of education it is known that most respondents in the secondary education group are 55 respondents (37.93%), the lowest percentage at the elementary level is 24 people (16.55%) and respondents with a tertiary education level are 24 people (16.55%). 81.38% of respondents did not work and 18.62% of respondents worked. From a total of 145 respondents it is known that 73.10%, as many as 106 people have heard about IVA tests, with the most information sources namely from health workers by 64.15%.

The results of the level of knowledge of respondents to the IVA examination of 145 respondents, 60 people have good knowledge with a percentage of 41.38%, 64 people have sufficient knowledge with a percentage of 44.14% and there are 21 people known to have a level of lack of knowledge about IVA examination with percentage of 14.48%.

Based on the level of education, the obtained distribution of respondents with a good level of knowledge on average has a level of secondary education and above. 24 people (16.55%) have secondary education and 22 people (15.17%) have higher education. For the distribution of respondents with the most basic education level, they have enough knowledge, 38 people (26.21%). There are no respondents who have a high level of education who have low knowledge.

The attitudes of women of childbearing age about IVA examinations, where most groups have good attitudes of 122 people with a percentage of 84.14%. While 15.86% or many 23 women have bad attitudes.

One hundred fifty five women of childbearing age as respondents, it is known that 51 people with a percentage of 35.17% have done or have had an IVA examination. This number is lower than respondents who did not do IVA examination, namely 94 people (64.83%).

The respondents who behaved carried out the IVA examination with the highest percentage having a good level of knowledge, namely 62.75% as many as 32 people and the lowest percentage having a lack of knowledge level, namely 3.92% (2 people). For the group of respondents who did not do an IVA examination, the highest

percentage was 50.00% in the knowledge group as many as 47 people, and the lowest group had 19 people less knowledge with a percentage of 20.21%. From statistical calculations, the Chi-Square test shows that $\chi 2$ = 14,805 with p = 0.000 which indicates that there is a significant relationship between knowledge and behaviour.

The relationship between attitudes of women of childbearing age with IVA examination behaviour, wherein the group of respondents who did IVA examinations 98.04% or as many as 50 people had good attitudes and 1 person (1.96%) had bad attitudes. In the group of respondents who did not do an IVA examination, 72 people (76.60%) were considered to have a good attitude. Another 22 people (23.40%) did not conduct an IVA examination indeed classified as having an attitude that is bad for IVA checks. Chi-Square Test shows that $\chi 2$ = 11.391 with p = 0.001 which shows that there is a significant relationship between attitude and behaviour.

Table 1. Characteristics of Research Subjects

Characteristics	N	%
Age		
<20	2	1.38
20-35	66	4552
> 35	77	53.10
Education		
Elementary school	24	16.55
Middle School	42	28.97
High school	55	37.93
College	24	16.55
Profession		
Does not work	118	81.38
Work	27	18.62
Knowledge of IVA Test		
Yes	106	73.10
No	39	26.90
Resources		
Mass media	17	16.04
Health workers	68	64.15
Family/community	6	5.66
Counselling	15	14.15

Table 2. Relationship of Knowledge of Fertile Age Women with IVA Examination in Bitung Barat Public Health Center in Bitung City

Knowledge	Behaviour						*P-value*
	Do		Not Do		Total		
	N	%	N	%	N	%	
Well	32	62.75	28	29.79	60	41.38	
Enough	17	33.33	47	50.00	64	44.14	
Less	2	3.92	19	20.21	21	14.48	0.000
Total	51	100.00	94	100.00			

Table 3. Relationship between Attitudes of Fertile Age Women with IVA Examination in the Bitung Barat Public Health Center in Bitung City

Attitude	Behaviour						*P-value*
	Do		Not Do		Total		
	N	%	N	%	N	%	
Well	50	98.04	72	76.60	122	84.14	
Bad	1	1.96	22	23.40	23	15.86	0.001
Total	51	100.00	94	100.00			

DISCUSSION

Government efforts to reduce morbidity and mortality from breast cancer and cervical cancer as the most cancers suffered by women is by early detection. As in one of the government activities "Movement for Prevention and Early Detection of Cancer in Women" carried out by the Ministry of Health of the Republic of Indonesia from 2015 to 2019, Visual Inspection of Acetic Acid (IVA) is an examination carried out to detect pre cervical cancer lesions. With the participation of women in the IVA, the examination is expected to increase early detection for cervical pre-cancerous lesions. This IVA examination is simple, easy, inexpensive, fast and can be done at a first-level health facility by midwives and doctors at the public health centres.[11]

The cause that becomes an obstacle for women in conducting early detection of cervical cancer is a lack of knowledge and doubts about the importance of the examination, fear of pain and reluctance due to feelings of shame and anxiety when doing the examination, even as for fear because of fear of knowing if the woman was proven to suffer uterine cancer. Low

awareness in the community is one of the factors that contribute to the high incidence of cervical cancer in Indonesia.[14]

In this study, the results showed from 145 samples of female respondents of childbearing age at the Bitung Barat Public Health Center in the Bitung city. From table 1, the general characteristics of respondents are divided into various distribution groups based on age, education level and employment status. The most known age group is over 35 years, which is 77 respondents (53.10%) and there are also 2 respondents under the age of 20 years (1.38%). The age group of 20-35 years was 66 people (45.52%). Based on the level of education it is known that the most respondents in the secondary education group are 55 respondents (37.93%), followed by the junior high school level as many as 42 people (28.97%), the elementary education level is 24 people (16.55 %) and respondents with tertiary education were 24 people (16.55%). 81.38% of respondents work as housewives and 18.62% of respondents are employed, including private employees, entrepreneurs and civil servants. From a total of 145 respondents, it is known that 73.10%, as many as 106 people have heard about IVA tests, with the most information sources namely from health workers by 64.15%. Apart from health workers, there were also respondents who heard information about IVA from the mass media (16.04%), from family/relatives (5.66%) and 14.15% information sources from extension activities. Judging from the number of respondents who had heard about the term and IVA examination described the socialization regarding this early detection method quite well.

The level of knowledge of respondents by level of education, obtained distribution of respondents with a good level of knowledge on average has a level of secondary education and above. Twenty four people (16.55%) have secondary education and 22 people (15.17%) have tertiary education. For the distribution of respondents with basic education level, 14 people (9.66%) had good knowledge about IVA examinations, 38 people (26.21%) had sufficient knowledge, and as many as 14 people (9.66%) were known to have low level of knowledge about IVA examination.

Education is a process of changing the attitudes and behaviour of a person or group and also efforts to mature humans through teaching and training efforts aimed at educating people. The level of knowledge influences the response to something that comes from outside. Highly educated people will provide a more rational response to the information coming in. From the research data it can be concluded that the higher a person's level of education, the response to information and the ability to perceive certain knowledge/information the better.

The attitudes of women of childbearing age about IVA examinations, where most groups have good attitudes of 122 people with a percentage of 84.14%. While 15.86% or a number of 23 women have bad attitudes. An attitude is a form of evaluation or feeling reaction. A person's attitude towards an object is a feeling of support (favourable) and a feeling of not supporting (unfavourable) on the object. The emergence of attitudes is based on the evaluation process in individuals who give the case the impulse of a stimulus in the form of good or bad value, positive or negative, pleasant or unpleasant.

Of 145, 51 (35.17%) respondents had undergone IVA examination. Another 64.83% as many as 94 people did not do IVA examination. The IVA examination in 2017 in the city of Bitung was considered quite successful, but the participation of women in Maesa district was very low. In this study, it is known that more people did not do IVA examination than did IVA examination. As for some of the limitations of this study include the researchers did not examine more deeply the reasons or causes of respondents not doing IVA examination. In addition, the questionnaire used was not accompanied by a question about whether the respondent had ever had a pap smear examination or not. Because there is a possibility of women of childbearing age who do not have an IVA examination but have already had a pap smear. If found by respondents like this, then the actual behaviour of the examination for early detection of cervical cancer is quite good. In the group of respondents who did IVA examinations, this study lacked a description of the behaviour of whether conducting routine IVA examinations or simply because there were activities. For that, we need a form of qualitative research using the deep interview method.

Table 2. shows that the respondents who behaved conducted an IVA examination with the highest percentage having a good level of knowledge, namely 62.75%, as many as 32 people. Of the respondents who did an IVA examination, 33.33% (17 people) had a sufficient level of knowledge, and the lowest percentage

had a lack of knowledge level of 3.92% (2 people). For the group of respondents who did not do an IVA examination, the highest percentage was 50.00% in the knowledge group with 47 people, followed by the good knowledge group of 28 people (29.79%), and the lowest group had 19 knowledge with the percentage 20.21%. The results obtained from this study are respondents with a good level of knowledge, the behaviour also tends to be good. Based on the results of statistical tests it is known that the significance value of p = 0.000 or smaller than 0.05. It can be concluded that there is a significant relationship between knowledge of women of childbearing age with IVA examination behaviour. This study has the same results as several other studies conducted previously, in Mojokerto, at the Public health Center of Buleleng-Bali, in Yogyakarta, in Tempuran sub-village, Karawang Sub-district, West Java. [18-21]

Table 3. shows the relationship between attitudes of women of childbearing age with IVA examination behaviour. As for the data from this study, it was found that more respondents did not carry out IVA examinations, from this table in the group of respondents who did IVA checks 98.04% or as many as 50 people had good attitudes. Only 1 person (1.96%) was judged to have a bad attitude towards IVA examination. Whereas in the group of respondents who did not do an IVA examination, of 94 people, 72 people (76.60%) were considered to have a good attitude. Another 23.40%, as many as 22 people who did not do an IVA examination indeed classified as having a bad attitude towards IVA examination. The results of this research data prove that the attitude of women of childbearing age is good then the IVA examination behaviour is also good. The relationship between the attitudes of women of childbearing age with IVA examination behaviour was stated to be meaningful based on the results of statistical tests known that the significance value of p = 0.001 or smaller than 0.05. A study conducted in Yogyakarta has the result that there is no relationship between the attitude and behaviour of IVA examination with a statistical test of p = 0.086.20 The difference in outcome is likely to be influenced by other factors. But other previous studies mostly have the same conclusions with this research in Mojokerto, research in Tempuran sub-village of Karawang Sub-district of West Java, and research at the Public Health Center of Buleleng-Bali, the relationship between attitude and IVA examination behavior has a value of p = 0.014.[18,19,21]

Various factors are known to influence the reason for women of childbearing age doing IVA examinations. In this case a person with a good education is known to have a good level of knowledge of IVA examinations which will then behave well in an IVA examination. So, with good IVA examination, the prevalence of cervical cancer is also expected to decrease. In addition to the low level of knowledge and attitudes of women of childbearing age, geographical factors because a place to live far from the inspection location can also be a cause of women of childbearing age in the Bitung Barat Public Health Center not conducting IVA examinations. The lack of opportunity and time to do the examination can also be a cause of women not doing IVA examination.

CONCLUSION

Women of childbearing age in the Bitung Barat Public Health Center in the majority of Bitung have a fairly good level of knowledge. The majority of women of childbearing age at the Bitung Barat Public Health Center in the Bitung city have a good attitude towards IVA examination. The level of education influences the level of knowledge and attitude towards IVA examination. Women of childbearing age with good IVA examination behaviour have a good level of knowledge. Women of childbearing age with good IVA examination behaviour tend to have good attitudes.

SUGGESTION

Further research can be done with a larger population and sample, to assess the behaviour of IVA examinations linked to other factors, or it can also be done in qualitative research. Collaboration from various parties, both government and health facility staff, is needed to increase socialization with various information media regarding early detection of cervical precancerous lesions and more approaches to the community so that community interest in conducting IVA examinations increases.

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Research Article

Elective versus Emergency Cesarean Sections: Mother and Fetal Outcome

Luaran Ibu dan Bayi pada Operasi Sesar Elektif dan Emergensi

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Abstract

Objective: To compare the outcomes of mothers and newborns in emergency cesarean section and elective cesarean section.

Methods: A prospective cohort study included 120 pregnant women consists of 60 women who performed an emergency cesarean section and 60 women who underwent elective cesarean section. Age, education level, occupation, income, history of comorbidities, history of abortion or miscarriage, antenatal care history, decision-making time until surgery is performed along with other components required, duration of operation, outcome of mother and fetal were obtained through interviews and questionnaires. Data were analyzed regarding fetal outcome and cesarean sections indications.

Results: The maternal and fetal outcome between emergency and elective cesarean section were not significantly different regarding on hospital stay, dehiscence, NICU admission, Apgar score and newborn status (dead or alive). Blood transfusion is the main difference significant indication for maternal outcome between emergency and elective procedure ($p<0.05$). The total duration of procedure <60 or >60 minutes and maternal-fetal outcome not significantly different between two type of procedures.

Conclusions: Emergency cesarean section at preterm gestational age with an operating time ≤60 minutes leads to greater transfusion blood requirements compared with elective cesarean section.

Keywords: emergency cesarean section, elective cesarean section, mother-infant outcome.

Abstrak

Tujuan: *Membandingkan luaran ibu dan bayi baru lahir di seksio sesarea emergensi dan elektif.*

Metode: *Penelitian kohort prospektif melibatkan 120 perempuan hamil terdiri atas 60 perempuan yang melakukan operasi seksio sesarea emergensi dan 60 perempuan melakukan operasi elektif. Usia, tingkat pendidikan, pekerjaan, pendapatan, riwayat komorbiditas, riwayat aborsi atau keguguran, riwayat asuhan antenatal, waktu pengambilan keputusan sampai operasi dilakukan bersamaan dengan komponen lain yang diperlukan, lamanya operasi, luaran ibu dan bayi diperoleh melalui wawancara dan kuesioner. Data yang dianalisis mengenai luaran ibu dan bayinya.*

Hasil: *Luaran ibu dan bayi antara seksio sesarea emergensi dan elektif tidak berbeda bermakna dalam hal lama rawat inap, dehisensi, admisi, skor Apgar dan status bayi baru lahir (meninggal atau hidup). Transfusi darah adalah indikasi penting utama yang berbeda untuk luaran ibu antara prosedur emergensi dan elektif ($p<0,05$). Durasi total prosedur <60 atau> 60 menit dan luaran ibu tidak berbeda secara signifikan antara kedua jenis seksio sesarea.*

Kesimpulan: *Tindakan seksio sesarea emergensi pada usia gestasi prematur dengan waktu operasi ≤60 menit menyebabkan kebutuhan transfusi darah lebih besar dibandingkan seksio sesarea elektif.*

Kata kunci: *luaran ibu-bayi, seksio sesarea elektif, seksio sesarea emergensi.*

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INTRODUCTION

Cesarean section is a type of obstetric procedure deliver the fetus through surgery on the abdominal wall and the uterus. This procedure performed as an alternative method if normal delivery cannot be performed for treating the mother and newborn.[1] The rate of cesarean section increases 20% but different in every countries. This increase is thought to be due to improved surgery techniques and facilities, more aseptic surgery, improved anaesthesia techniques, postoperative cesarean delivery and shorter duration of care.[2,3] The increasing rate associated with the increased in morbidity and costs in addition to improving fetal outcome.[4-6]

Cesarean section also contributes to the mortality rate of about 5.8 per 100,000 deliveries as well as a higher rate of caesarean section morbidity accounting for 27.3 per 1,000 deliveries, compared to a normal delivery 9 per 1,000 deliveries.[7] Previous research by Ghazi found that maternal mortality in the caesarean section was 40-80/100,000; 25 times greater than normal delivery. Postoperative cesarean section pain is about 15% and about 90% is caused by infection (endometritis, urinary tract infection and sepsis due to injury). Approximately 25% of complications of cesarean section occur in emergency procedures compared to 5% in elective procedures.[8]

The standard for response time does not exceed 30 minutes.[9] American College of Obstetrics and Gynecology also recommends a maximum interval of 30 minutes to decide to conduct emergency surgery and 15 minutes for a very urgent cesarean section.[10] Extracting the fetus within the suggested interval time significantly improved the Apgar score and pH However, there is no strong evidence to suggest that response time more than 30 minutes or less is associated with improving mother or fetal outcomes.[11] In addition, emergency caesarean section does not have a general classification of its urgency level and the recommended time response is not always adhered to due to limited facilities and medical team. This study aims to compare the outcomes of mothers and newborns in emergency cesarean section and elective cesarean section.

METHODS

A prospective cohort study was conducted on pregnant women with an indication of an emergency or elective cesarean section at mother and child hospital in Makassar. Age, education level, occupation, income, history of comorbidities, history of abortion or miscarriage, antenatal care history, decision-making time until surgery is performed along with other components required, duration of operation, outcome of mother and fetal were obtained through interviews and questionnaires. Written informed consent obtained from all pregnant women and the Health Research Ethics Committee of Faculty of Medicine Universitas Hasanuddin, Makassar approved the study. All analyses were performed using the statistical analyzed software. A p-value <.05 was considered statistically significant.

RESULTS

The present study included 120 pregnant women consists of 60 women who underwent emergency cesarean section and 60 women who underwent elective cesarean section. The baseline women characteristics (Table 1) show the age of gestation, decision delivery interval <8 minutes and duration of procedure <60 minutes were significantly different between emergency and elective cesarean section. There was no difference in age, parity, IC time, consultation time and the decision to anaesthesia between the two groups of procedure ($p>0.05$). The maternal and fetal outcome between emergency and elective cesarean section were not significantly different regarding on hospital stay, dehiscence, NICU admission, Apgar score and newborn status (death or alive) (Table 2). Blood transfusion is the main difference in significant indication for maternal outcome between emergency and elective procedure. The total duration of procedure <60 or >60 minutes and maternal-fetal outcome not significantly different between the two types of procedures (Table 3).

Table 1. Patients Characteristics

Characteristics	Emergency		Elective		RR	95%CI	*P-value*
	n	%	n	%			
Age (yo)							
<25 and >35	28	46.7	22	36.7	1.273	0.829-1.954	0.26
25-35	32	53.3	38	63.3			
Age of gestation (weeks)							
28-36	19	31.7	8	13.3	2.375	1.128-5.000	0.01
37-42	41	68.3	52	86.7			
Parity							
Primiparous	35	58.3	30	50	1.167	0.383-1.625	0.36
Multiparous	25	41.7	30	50			
IC time (minutes)							
>10	7	11.7	5	8.3	1.400	0.471-4.166	0.54
≤10	53	88.3	55	91.7			
Counselling time (minutes)							
> 30	34	56.7	45	75	0.756	0.582-0.985	0.30
≤ 30	26	43.3	15	25			
Decision to anesthesia time (minutes)							
> 8	16	26.7	20	33.3	0.800	0.461-1.389	0.42
≤ 8	44	73.3	40	66.7			
Decision delivery interval (minutes)							
> 8	41	68.3	52	86.7	0.788	0.646-0.962	0.01
≤ 8	19	31.7	8	13.3			
Decision delivery interval (minutes)							
> 30	56	93.3	58	96,7	0.96	0.88-1.04	0.40
≤ 30	4	6.7	2	3.3			
Total duration of caesarean section (minutes)							
> 60	14	23.3	6	10	2.33	0.96-5,66	0.05
≤ 60	46	76.7	54	90			

Table 2. Maternal and Fetal Outcomes

Outcomes	Emergency		Elective		RR	95%CI	*P-value*
	n	%	n	%			
Maternal							
Hospital stay (days)							
> 3	5	8.3	3	5	1.667	0.42-6.66	0,71**
≤ 3	55	91.7	57	95			
Blood transfusion							
Yes	11	18.3	2	3.3	5.50	1.27-23.76	0.01*
No	49	81.7	58	96.7			
Dehiscence							
Yes	4	6.7	4	6.7	1.000	0.26-3.81	1.00**
No	56	93.3	56	93.3			
Fetal							
Hospital stay (days)							
> 3	8	13.3	2	3.3	4.000	0.88-18.06	0.05*
≤ 3	52	86.7	58	96.7			
NICU admission							
Yes	8	13.3	3	5	2.667	0.743-9.569	0.11*
No	52	86.7	57	95			
Apgar score							
< 7	17	28.3	11	18.3	1.545	0.792-3.016	0.19*
≥ 7	43	71.7	49	81.7			
Outcomes							
Death	2	3.3	0	0	0.967	0.922-1.013	0.49**
Live	58	96.7	60	100			

**Chi-square test, ** Fischer-exact test*

Table 3. Total Duration of Caesarean Section and Maternal-fetal Outcome

Outcomes	> 60 minutes		≤ 60 minutes		RR	95%CI	*P-value*
	n	%	n	%			
Maternal							
Hospital stay (days)							
> 3	2	10.0	6	6.0	1.66	0.36-7.67	0.61
≤ 3	18	90.0	94	94.0			
Blood transfusion							
Yes	3	15.0	10	10.0	1.50	0.45-4.96	0.51
No	17	85.0	90	90.0			
Dehiscence							
Yes	1	5.0	7	7.0	0.71	0.93-5.49	1.00
No	19	95.0	93	93.0			
Fetal							
Hospital stay (days)							
> 3	4	20.0	6	6.0	3.33	1.34-10.74	0.06
≤ 3	16	80.0	94	94.0			
NICU admission							
Yes	2	10.0	9	9.0	1.11	0.25-4.76	1.00
No	18	90.0	91	91.0			
Apgar score							
< 7	6	30.0	22	22.0	1.36	0.64-2.92	0.56
≥ 7	14	70.0	78	78.0			
Outcomes							
Death	0	0	2	2.0	1.02	0.99-1.04	1.00
Live	20	100	98	98.0			

** Fischer-exact test*

DISCUSSION

Elective cesarean section highly proportion performed in age between 25 and 35, age of gestation 37-42 weeks and multiparous women. A study show 38.95% of cases of emergency cesarean section performed on primigravida mothers with younger age (27.8±6.07 years)[12] whereas other studies show a slightly higher rate between 42% and 55.48%, respectively.[13,14] A study show 19.7% of primigravida performed elective cesarean section and 70.8% performed emergency section compared with 80.3% elective procedure and 29.2% emergency procedure in multigravida.[2] Another study show emergency and elective cesarean section performed slightly higher in primigravida compared with multigravida.[15]

The maternal and fetal outcome between emergency and elective cesarean section were not significantly different regarding hospital stay, dehiscence, NICU admission, Apgar score and newborn status (death or alive). However, our results show elective cesarean section had a higher proportion of improved outcome regarding maternal-fetal outcome indicators. Various factors contribute to maternal-fetal outcome to the elective or emergency section. A study shows emergency section associated with younger mothers, maternal illiteracy, primiparity, insufficient prenatal care, a referral from other institution for pregnancy complications or delivery, cesarean section performed under general anesthesia, lower birth weight, neonatal morbidity and early mortality, and admission in the neonatal intensive care unit.[12] Another findings of our study were blood transfusion higher in the emergency compare with the elective section. Previous studies show conflicting result regarding blood transfusion during the procedure. A study show blood transfusion performed in 34% of cases of emergency section whereas 16% cases in elective section.[15]

The present study show total duration of cesarean section for less than 60 has better maternal-fetal outcome compared with more than 60 minutes procedure. A study in Nigeria shows no significant correlation between the response time of 30 minutes and perinatal outcome.[16] However, a study show a longer duration of procedure than previous studies that is 75 minutes. This study found that response time was influenced by the decision to anaesthesia time, anaesthesia to delivery of baby, prolonged labour and hypertension disorders.[17] Study conducted in India found response time 30 minutes for a cesarean section could be achieved in 30% of cases of emergency cesarean section. The major

cause of cesarean section delay in this study was a long waiting list of emergency cesarean section in the operation theatre. Another cause is the excessive procedure in the labour room results in delay in preparing the women for operation, counselling, informed consent and shifting the women in the pre-operative area.[18]

CONCLUSION

In conclusion, an emergency cesarean section at preterm gestational age with an operating time ≤60 minutes leads to greater transfusion blood requirements compared with an elective cesarean section.

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Research Article

Quality of Life and Sexual Function of Placenta Accreta Spectrum Disorder Patients after Surgery

Kualitas Hidup dan Fungsi Seksual Pasien Placenta Accreta Spectrum Disorder Pascaoperasi

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Abstract

Objective: To evaluate sexual function and quality of life features using two validated Female Sexual Function Index (FSFI) questionnaires, and the Short-Form Health Survey (SF-36) in patients with sexually active on Placenta Accreta Spectrum (PAS) Disorder patient.

Methods: This research is a cross sectional analytic observational study which was conducted in Haji Adam Malik General Hospital from January 2017 - December 2019. Thirty-five study patients who have been diagnosed with PAS disorder and have been treated for at least 3 months were divided into hysterectomy and conservative groups. This study data consisted of primary data from interviews and secondary data from medical records. Independent T test is used if it is normally distributed and Mann-Whitney is used if it is not normally distributed, and it is declared significant if the P value is <0.05.

Result: From 8 assessment variables in the SF-36 questionnaire by comparing the questionnaire scores of PASD patients in the hysterectomy and conservative groups by showing significant results on social function (P value 0.021). Whereas in the FSFI questionnaire, there were 6 variables to assess the sexual function of patients with pain variable showing significant results (P value 0.007).

Conclusions: There were differences in quality of life (social function) and sexual function (pain) in PASD patients in the hysterectomy and conservative groups.

Keywords: female sexual functional index, placenta accreta spectrum, quality of life, short-form health survey.

Abstrak

Tujuan: *Untuk mengevaluasi fungsi seksual dan fitur kualitas hidup dengan menggunakan dua kuesioner tervalidasi Female Sexual Function Index (FSFI), dan Short-Form Health Survey (SF-36) pada pasien dengan placenta accrete spectrum (PAS) disorder yang aktif secara seksual setelah tindakan operasi.*

Metode: *Penelitian ini merupakan penelitian analitik observasional dengan metode potong lintang yang dilaksanakan di Rumah Sakit Umum Haji Adam Malik dari January 2017-December 2019. Tiga puluh lima pasien yang didiagnosis dengan spektrum plasenta akreta dan telah ditatalaksana minimal 3 bulan dibagi menjadi kelompok histerektomi and konservatif. Data penelitian ini terdiri atas data primer dari wawancara dan data sekunder dari rekam medis. Uji T independen digunakan jika berdistribusi normal dan Mann-Whitney digunakan jika tidak berdistribusi normal, serta dinyatakan signifikan jika nilai P <0.05.*

Hasil: *Dari 8 variabel penilaian dalam kuesioner SF-36 dengan membandingkan skor kuesioner pasien PASD pada kelompok histerektomi dan konservatif dengan menunjukkan hasil yang signifikan pada fungsi sosial (nilai P = 0,021). Sedangkan dalam kuesioner FSFI terdapat 6 variabel untuk menilai fungsi seksual pasien dengan variabel nyeri yang menunjukkan hasil yang signifikan (nilai P = 0,007).*

Kesimpulan: *Terdapat perbedaan dalam kualitas hidup (fungsi sosial) dan fungsi seksual (nyeri) pada pasien PASD di kelompok histerektomi dan konservatif.*

Kata kunci: *indeks fungsional seksual perempuan, kualitas hidup, spektrum plasenta akreta, survey kesehatan singkat*

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INTRODUCTION

Placenta Accreta Spectrum (PAS) disorder is a condition of the attachment of the placenta that is not normal to the uterus. Common and severe short-term PAS morbidity, including massive obstetric haemorrhage, need for emergency hysterectomy, intensive care unit admission, prolonged hospitalization, and even maternal death. The incidence of PAS has increased over the past 40 years from approximately 1 in 4,000 in the 1980s to as high as 1 in 533. When this condition is diagnosed antenatally and women are referred to specialist centres for delivery, the outcome improves significantly.[1]

In women with a final diagnosis of placenta increta or percreta, the antenatal diagnosis is associated with reduced bleeding rates and reduced need for blood transfusions, possibly because women diagnosed antenatally are more likely to have preventive therapy for bleeding, and are less likely to attempt to remove their placenta. In addition, more than half of women with placenta accreta, increta, or percreta underwent hysterectomy.[2]

Although short-term PAS morbidity is sufficiently described, there are limited data available regarding long-term health and quality of life after PAS surgery. Patients undergoing peripartum hysterectomy for other conditions may suffer from long-term depression, post-traumatic stress disorder (PTSD), and sexual dysfunction. These long-term effects may be related to several factors including a wider surgical dissection leading to increased scarring and increased emotional burden caused by hysterectomy, loss of fertility.[1]

When patients choose a hysterectomy, they should be counselled by their doctor about their medical condition, reasons for surgery, planned surgical procedures, the expected recovery process, and potential long-term problems. Theoretically, removal of the uterus has the potential to affect the pelvic anatomical structures including the regional nerve supply. Lubrication and orgasm are thought to be related to the supply of nerves to the upper vagina and many nerves pass through the operating field through the uterovaginal plexus. This plexus can be damaged during a hysterectomy, as a result, changes in sexual desire and orgasm can occur after hysterectomy. Hysterectomy can also be associated with loss of bodily integrity, loss of fertility (if the ovaries are removed), and psychosexual and socio-cultural problems including reduced partner intimacy and feelings of loss of femininity. After this operation, the lives of women may be affected in different domains and it is very important to assess the extent of this problem.[3]

This study aims to evaluate sexual function and quality of life features using two validated Female Sexual Function Index (FSFI) questionnaires, and the Short-Form Health Survey (SF-36) in PAS patient with sexually active after hysterectomy or conservative surgery.

METHODS

This research is a cross-sectional analytic observational study that was conducted in Haji Adam Malik General Hospital from January 2017-December 2019. Thirty-five study subjects were collected by total sampling and divided into 2 groups based on their therapy which was the hysterectomy and non-hysterectomy groups. Patients who have been diagnosed with placenta accrete spectrum based on surgical findings and histopathological confirmation have been treated for at least 3 months were considered as study subjects. Patients who could not be interviewed because they could not be contacted or were unable to communicate and had incomplete medical records were excluded from this study.

All eligible study subjects were called and interviewed by phone. All study subjects were asked to fill the validated Indonesian version FSFI and SF-36 questionnaires by google form which the link was sent through text message. There were 5 factors included in the assessment, such as arousal, stimulation, lubrication, orgasm, satisfaction and pain. If the score of FSFI was > 26.5 was interpreted as no sexual dysfunction, while FSFI score < 26.5 was considered significant sexual dysfunction. The SF-36 questionnaire measures eight scales: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. Each scale is directly transformed into a 0-100 scale on the assumption that each question carries equal weight. The lower the score the more disability. The higher the score the less disability and a score of 100 is equivalent to no disability.

This study data consisted of primary data from interviews and questionnaire scores which were mean of FSFI and SF-36 scores, while secondary data from medical records, consisted of maternal age, gestational age, parity, PAS score, amount of

bleeding, urologic complication, neonatal death and duration of surgery.

The study subjects' characteristics are presented in frequency distribution table. The data was analyzed using Statistical Product and Service Solutions 24th version. Independent T-test is used if it is normally distributed and Mann-Whitney is used if it is not normally distributed, and it is declared significant if the *P-value* is <0.05.

RESULTS

From January 2017 to December 2019, 141 patients were diagnosed with PASD. There are 4 incomplete medical records and 2 patients died. There were 135 patients who met the inclusion and exclusion criteria. Then, there were 40 cellphone numbers of the inactive patients. Of the 95 patients that the researchers could contact, 38 patients did not fill out the questionnaire (did not respond), 13 patients refused, and 35 patients filled out the questionnaire (response).

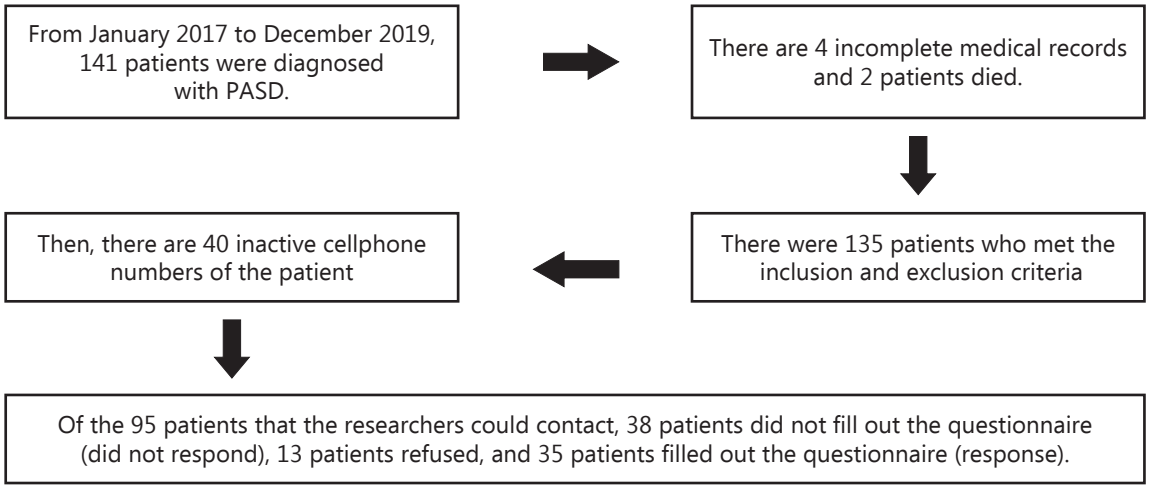

Table 1. Sample Characteristic Based on Type of Surgery

	Total n = 35, (100%)	**Hysterectomy n = 23 (65.7%)**	**Conservative n = 12 (34.3%)**	***P-value***
Maternal Age				0.506[a]
20-35	23 (65.7)	16 (58.3)	7 (41.7)	
>35	12 (34.3)	7 (69.6)	5 (30.4)	
Gestational Age		37 (36-38)	38 (37-39)	0.000[b]
Parity				0.123[a]
Second parity	7 (20)	3 (42.9)	4 (52.1)	
Multiparity	25 (71)	19 (76)	6 (24)	
Grand Multiparity	3 (9)	1 (33.3)	2 (66.7)	
PAS score				0.000[a]
0	7 (20)	0 (0)	7 (100)	
1	5 (14)	0 (0)	5 (100)	
2	13 (37)	13 (100)	0 (0)	
3	10 (29)	10 (100)	0 (0)	
Blood Loss		1093.48 ± 71.12	437.5 ± 48.26	0.000[b]
Urologic Complication				0.293[a]
Yes	2 (5.7)	2 (100)	0 (0)	
No	33 (94.3)	21 (63.6)	12 (36.4)	
Neonatal Death				0.464[a]
Yes	1 (2.9)	1 (100)	0 (0)	
No	34 (97.1)	22 (64.7)	12 (35.3)	
Length After Operation (month)		6 (5-7)	3.5 (3-4)	0.000[b]

[a] *Chi-Square Test,* [b] *T Independent Test*

In this study, data on patient characteristics assessed were maternal age, wherein the hysterectomy and conservative groups the majority were aged 20-35 years 16 (58.3%) and 7 (41.7%) with a p-value of 0.506, the difference in gestational age in the histrectomy group 37 (36-38) and conservative 38 (37-39) with p-value 0.000. The parity characteristics of these patients were dominated by multiparity, in the hysterectomy group 19 (76%) and the conservative group 6 (24%) (p-value 0.217). PAS scores have significant difference between two groups with PAS score 2 in the hysterectomy group and PAS score 0 in the conservative group. The mean bleeding between hysterectomy group was 1093.48 ± 71.12 and the conservative group 437.5 ± 48.26 (p-value 0.000). Urologic complications were present in 2 patients in the hysterectomy group with p value 0.464. Neonatal death was only 1 case in the hysterectomy group with a p-value of 0.293. The difference in duration after surgery in the hysterectomy group was 6 (5-7) months and the conservative group was 3.5 (3-4) months (p-value 0.000)

Table 2. Quality of Life Based on Short form (SF) – 36 Questionnaire

Domain SF 36	Hysterectomy	Conservative	*P-value*
Physical Functioning	70 (10-100)	87.5 (0-100)	0.197
Role Functioning (Physical)	50 (0-75)	50 (0-100)	0.497
Role Functioning (Emotional)	66.7 (0-100)	33.3 (0-100)	0.273
Energy/Fatigue	60 (15-90)	70 (35-95)	0.229
Emotional Wellbeing	76 (20-100)	84 (60-96)	0.134
Social Functioning	62.5 (12.5-100)	87.5 (62.5-100)	0.021*
Pain	67.5 (0-100)	90 (45-100)	0.128
General Health	55 (15-80)	70 (30-100)	0.055

** Mann-Whitney Test*

In the table above, there are 8 assessment variables in the SF-36 questionnaire by comparing the questionnaire scores of PASD patients in the hysterectomy and conservative groups by showing significant results on social function (p-value 0.021) while on physical functioning, role functioning (physical), role functioning (emotional), energy / fatigue, emotional wellbeing, social functioning, pain, and general health do not show significant results.

Table 3. Sexual quality based on Female Sexual Function Index (FSFI)

Domain FSFI	Hysterectomy	Conservative	*P-value*
Desire	36 (3-54)	36 (3-48)	0.913
Arousal	33.82±14.2	36.75±12.4	0.518
Lubrication	39 (0-57)	42 (3-54)	0.916
Orgasm	36 (0-56)	44 (2-56)	0.514
Satisfaction	36 (0-52)	46 (2-56)	0.117
Pain	6 (0-44)	40 (2-56)	0.007*

**Mann-Whitney Test*

Whereas in the FSFI questionnaire, there were 6 variables to assess the sexual function of patients with pain variable showing significant results (p-value 0.007), other variables namely desire, arousal, lubrication, orgasm, and satisfaction did not show significant results.

DISCUSSIONS

In this research on placenta accreta spectrum patients showed mean age of the patients in hysterectomy group was 32.9 + 4.1 years compared to the conservative group was 31.7-31.8 + 4.2-4.5 years. Meanwhile, for the number of parity there was a significant difference between the hysterectomy and conservative groups (p <0.001) with the majority of the parity 3-4 as much as 57.9%; followed by> 5 as much as 36.8% and at least 5.3% with parity 1-2. Whereas in the conservative group, the majority appears with parity 1-2 (54.2% - 87.5%); followed by the parity 3-4 (12.5% - 45.8%); without patients with parity > 5.Based on previous C-section history, there was a significant difference between the

hysterectomy and conservative groups (p <0.001) with the majority of 47.4% of hysterectomy patients having history of 3 times C-section, followed by 42, 1% with 4 times, and 10.5% as much as 2 times, whereas in the conservative group it appears that the majority of patients with a history of 2 times C-section (37.5% -50%), followed by 1 times (20,8%-50%), 37.5% 3 times and only 4.2% with a history of 4x C-section. [4]

On 97 consecutive patients with PAS disorders that were treated in their hospital showed that mean patient age was 29.89 (range: 20 to 40) years. The average gestational week at pregnancy termination was 19.36 (range: 13 to 27+ 4) weeks. The median gravidity was 2, including 3 nulliparous patients (10.3%). The most common risk factor was previous curettage operation (75.9%), followed by previous cesarean delivery (69.0%) and placenta previa (41.4%).[5]

On the placenta accreta spectrum patients showed that in the conservative group, the mean blood loss within 24 hours after surgery was significantly lower than the hysterectomy (H) group (1518 ± 1275 vs 4309 ± 2550 ml in group H, p < 0.001). Patients with> 1000 ml blood loss in group H were more significantly than in group C (93.6% [131/140] vs. 61.4% [86/140], p <.001). More patients received blood transfusions in group H than in group C (p = 0.014). There were no significant differences between the two groups in terms of bladder injury, postoperative anemia, fever, and disseminated intravascular coagulation. The neonatal outcomes in the two groups showed no difference.[6]

The research which evaluated Quality of Life (QoL) after hysterectomy in placenta accreta (PAS) spectrum patients showed that patients with PAS experienced significantly more continuous pain after 6 months post-partum on the SF-36 scoring. Specifically, women with accreta reported a "moderate" pain score over 4 weeks versus a "very mild" pain score mean for patients with cesarean complications. (p = 0.025). When adjusted for the SF-36 domain and compared the hysterectomy outcome between accreta patients and cesarean complications showed a physical function of 89.6 vs 94.3 (p = 0.237), physical role function 80.4 vs 91.4 (p = 0.197), emotional role function 76.2 vs 88.6 (p = 0.175), energy and fatigue 48.1 vs 54.3 (p = 0.346), emotional well-being 73.5 vs 78.3 (p = 0.411), social function 82 , 5 vs 89.5 (p = 0.241), pain 66.8 vs 83.4 (p = 0.013) and general health 74.3 vs 74.9 (p = 0.929). From these results, it appears that the pain domain has a significant difference between the hysterectomy group with placenta accreta spectrum indications compared to complications of cesarean section.[7]

There was a prospective cohort study of women with risk factors for PAS enrolled before birth. The correspondents are women who underwent cesarean hysterectomy due to PAS. At 6 months postpartum, women were at increased risk of re-admission (odds ratio [OR] 5.83, 95% confidence interval [CI] 1.40-24.3), post-coitus pain (OR 2.50, 95% CI 1.04 6.02), anxiety / worry (OR 3.77, 95% CI 1.43-9.93), but statistically not significant for the likelihood of incidence of additional surgery (OR 3.39, 95% CI 0, 99-11.7) or sadness and depression (OR 2.45, 95% CI 0.87 6.95). At 12 months, women with PAS were more likely to report post coitus pain, sadness / depression, and anxiety / worry. At a time duration of 36 months, women with PAS were more likely to report sadness / depression, anxiety / worry, and additional surgery. Women with PAS reported significantly lower quality of life in the domains of physical function, role function, social functioning, and pain at 6 months postpartum, but not in other domains of quality of life. Decreased quality of life was also reported at 12 and 36 months post-hysterectomy in the PAS group.[1]

The present study at assessing sexuality after hysterectomy using the Female Sexual Function Index (FSFI) showed that Total FSFI score was 19.4 ± 3.6 (median 19.8) and for the domains: 3.2 ± 0.9 (desire); 3.2 ± 0.9 (arousal); 3.1 ± 0.6 (lubrication); 3.1 ± 0.7 (orgasm); 3.5 ± 1.1 (satisfaction) and 3.2 ± 1.2 (pain/dyspareunia). All women displayed sexual dysfunction (total FSFI score ≤ 26.55).[8] The long-term effects of hysterectomy affect psychological as well as physical health. Some studies reported that hysterectomy could lead to sexual dysfunction and depression.[9] Concerns about sexual function are an important cause of anxiety for women undergoing hysterectomy. Indeed, 21 % of women with a mean age of 59 stated that the uterus is important for their sexual experience and after hysterectomy 10–20 % may experience deterioration of their sexual function. possible pathways for deleterious physical effects of hysterectomy: scar tissue in the vagina might prevent full ballooning of the upper vagina, removed tissue may reduce the capacity for vasocongestion and with or without nerve damage, this could reduce arousal or cause dyspareunia. Vaginal length was not related to sexual function. Experimental evidence confirmed that hysterectomy caused sensory

loss in the vagina, without impacting sexual function.[10] Women undergoing hysterectomy reported low normal level of vaginal lubrication that implied the potential sexual-mental arousal following the hysterectomy although no significant difference was found between groups undergoing hysterectomy and groups with fibroids but not undergoing hysterectomy in terms of sexual arousal women with a history of radical hysterectomy showed a significant decrease in maximum vaginal pulse amplitude during sexual arousal, and the variation in vaginal pulse amplitude during sexual arousal occurred with regard to the fact that all the patients experienced equally strong sexual arousal.[11] However, studies of sexual function assessed by FSFI in placenta accreta patients undergoing hysterectomy have not been found.

CONCLUSION

There were differences in quality of life (social function) and sexual function (pain) in PASD patients in the hysterectomy and conservative groups.

Abbreviations

FSFI: Female Sexual Function Index ; **SF-36:** Short-Form Health Survey; **PAS:** Placenta accreta spectrum; **PTSD:** post-traumatic stress disorder; **QoL:** Quality of Life.

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

All authors made substantial contributions to this manuscript. They all participated in the conception and drafting of the manuscript including the interpretation of data from literature and (critically) revised this manuscript. All authors approved the final version to be published.

Ethics approval and consent to participate

Ethical approval for the study was granted by the Medical Ethics Committee of Universitas Sumatera Utara **(NO:32/KEP/USU/2020)**. All participants gave informed written consent prior to any collection of data.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Research Article

Association of Obstetric Risk Factors with Postpartum Urine Retention in Spontaneous Labor

Hubungan Faktor Risiko Obstetrik dengan Retensio Urin Postpartum pada Persalinan Spontan

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Abstract

Objective: To determine the relationship between obstetric risk factors and the incidence of postpartum urinary retention in spontaneous labour at RSUD Ulin Banjarmasin.

Methods: This clinical study used an analytical observational design with a cross-sectional approach. The population of this study was patients with a diagnosis of postpartum urinary retention in spontaneous labour in the delivery ward and postpartum ward of Ulin Banjarmasin Hospital between January 2018-January 2020. The sample for this study was a part of the target population selected by purposive sampling, which fulfilled the inclusion and exclusion criteria. Data were analyzed using the Chi square test and multivariate analysis using binary logistics.

Result: The results showed 35 samples of patients diagnosed with postpartum urinary retention in spontaneous labour and had met the inclusion and exclusion criteria. Characteristic data of the study samples found that most of the study subjects were> 35 years old, 27 patients (77%), 21 patients (60%) of cases with primigravida parity, 26 patients (76%) with the duration of second stage labour ≥1 hour. Episiotomy was performed in 30 patients (86%), 34 patients (97%) had a newborn birthweight of <4000 grams. There was a significant association between the risk factors for parity in primigravida (p-value 0.02), second stage labour duration in primigravida (p-value 0.01), and episiotomy (p-value 0.01), with postpartum urinary retention in spontaneous labour. In contrast, age (p-value 0.19), and birthweight (p-value 0.10) were not significantly associated with postpartum urinary retention in spontaneous labour.

Conclusions: There were significant associations between obstetric risk factors (parity, duration of second stage labour, and episiotomy) with postpartum urinary retention in spontaneous labour. Whereas age and birth weight were not significantly associated with postpartum urinary retention in spontaneous labour.

Keywords: obstetric risk, postpartum retention, spontaneous delivery.

Abstrak

Tujuan: *Mengetahui hubungan faktor risiko obstetrik dengan kejadian retensio urin postpartum pada persalinan spontan di RSUD Ulin Banjarmasin.*

Metode: *Penelitian ini merupakan penelitian klinis dengan rancangan observasional analitik dengan pendekatan potong lintang. Populasi dari penelitian ini adalah ibu postpartum yang didiagnosis dengan retensio urin postpartum pada persalinan spontan di kamar bersalin dan di ruangan nifas RSUD Ulin Banjarmasin periode Januari 2018-Agustus 2020. Data dianalisis bivariat menggunakan uji Chi square dan analisis multivariate dengan menggunakan binary logistik.*

Hasil: *Didapati 35 sampel yang didiagnosis retensio urin postpartum pada persalinan spontan dan memenuhi kriteria inkulusi dan eksklusi. Data karakteristik sampel penelitian ditemukan usia terbanyak subyek penelitian berusia >35 tahun sebanyak 27 pasien (77,14%), kasus dengan paritas primigravida sebanyak 21 pasien (60%), lama kala dua primigravida >1 jam sebanyak 26 pasien (76%). Tindakan episiotomi sebanyak 30 pasien (86%), berat bayi lahir terbanyak pada berat <4.000 gram yaitu sebnyak 34 pasien (97%). Terdapat hubungan yang bermakna pada faktor risiko paritas pada primigravida dengan p value 0,02, lama kala dua dengan p value 0,01, dan tindakan episotomi dengan p value 0.01 dengan kejadian retensio urin postpartum sedangkan didapatkan hasil yang tidak bermakna pada risiko obstetrik usia dengan p value 0.19 dan berat bayi lahir dengan p value 0.10 pada kejadian retensio urin postpartum.*

Kesimpulan: *Terdapat hubungan signifikan antara faktor risiko obstetrik (paritas, lama kala dua dan tindakan episotomi) dengan retensio urin postpartum persalinan spontan. Sedangkan umur dan berat badan lahir tidak berhubungan dengan retensio urin postpartum pada persalinan spontan*

Kata kunci: *persalinan spontan, risiko obstetrik, retensio postpartum.*

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INTRODUCTION

Postpartum urinary retention is a common phenomenon during the puerperium, with a varying prevalence between 1.5% and 45%.[1] Urinary retention is one of the post-surgical complications, either obstetric or gynecologic surgery. Postpartum urinary retention is defined as the absence of spontaneous voiding or the inability to spontaneously urinate that begins 6 hours after vaginal delivery, and no spontaneous voiding 6 hours after catheter removal in cesarean section delivery (24 hours after delivery).[2]

Postpartum urinary retention has a varying of clinical manifestations such as sudden pain along with the inability to spontaneously void the bladder in 24 hours after vaginal delivery, with a bigger urinary volume compared to bladder capacity and thus requiring catheterization.[2]

The incidence rate for postpartum urinary retention varies between 1.7% - 17.9% due to various definitions and study methods.[3] The incidence rate for postpartum urinary retention is 4%.[4]

A prospective case-control study discovered that 8 (1.5%) of 530 women develop postpartum urinary retention after vaginal delivery.[4,5] In Indonesia, the incidence rate for postpartum urinary retention is approximately 14.8%.[6] Ulin Banjarmasin Hospital reported that there are 11 cases of postpartum urinary retention out of 2,850 deliveries in 2002-2003, 8 of these cases (81.8%) occurred in spontaneous vaginal delivery, 2 of cases (18.2%) in vacuum extraction, and 1 of cases (1%) in cesarean section.[7]

A study in Kandou Manado Hospital stated that postpartum urinary retention is associated with some obstetric risk factors such as perineal laceration or episiotomy, assisted vaginal delivery, duration of first stage labour>12 hours, duration of second stage labour>1 hour in multiparity, and birth weight of >3800 gram.[8] The aim of this study was to analyze the association of obstetric risk factors, which are age, parity, duration of second stage labour, episiotomy, and birth weight, with the incidence of postpartum urinary retention in spontaneous labour in Ulin Banjarmasin Hospital, South Kalimantan Province in the period of January 2018 – January 2020.

METHODS

This clinical study used an analytical observational design with a cross-sectional approach. The population of this study was patients with a diagnosis of postpartum urinary retention in spontaneous labour in the delivery ward and postpartum ward of Ulin Banjarmasin Hospital.

This study's data were secondary data from the medical records of patients diagnosed with postpartum urinary retention in spontaneous labour in Ulin Banjarmasin Hospital in the period of January 2018 – January 2020. The sample for this study was part of the target population selected by purposive sampling, which fulfilled the inclusion and exclusion criteria. This study's inclusion criteria include patients diagnosed with postpartum urinary retention in spontaneous labour in Ulin Banjarmasin Hospital. In contrast, exclusion criteria include patients' data were not completely recorded, patient with assisted vaginal delivery (vacuum or forceps extraction), and cesarean section (SC).

The obtained data were analyzed by using SPSS software. We used bivariate analysis by the Chi-square test to find the OR, confidence interval (CI), and multivariate analysis using binary logistic. P-value of <0.05 indicated a significant result.

RESULTS

There were 35 patients diagnosed with postpartum urinary retention in spontaneous labour who had met inclusion and exclusion criteria. Characteristic data of the study samples showed that 27 patients (77%) were >35 years old, and 8 patients (23%) were <35 years old. Cases of primigravida were found in 21 patients (60%), multigravida in 14 patients (40%). Cases of second stage duration ≥1 hour were found in 26 patients (76%) and <1 hour in 9 patients (24%). 30 patients (86%) underwent episiotomy, and 5 patients (15%) did not get an episiotomy. Newborn birthweight of <4,000 grams was found in 34 patients (97%) and >4,000 grams in 1 patient (3%).

Table 1. The Characteristics of Study Samples

Subject Characteristics	Frequency	(%)
Risk Factors		
Age (y o)		
>35	27	77
<35	8	23
Parity		
Primigravida	21	60
Multigravida	14	40
Duration of the second stage of labor in primigravida (hour)		
>1	26	76
<1	9	24
Episiotomy		
Yes	30	86
No	5	14
Birthweight of the newborn (gr)		
>4,000	1	3
<4,000	34	97

Table 2 showed that obstetric risk factors in postpartum urinary retention are parity, duration of second stage labour, episiotomy, and birthweight. This table showed that woman age >35 years old was at higher risk to develop postpartum urinary retention compared to <35 years old (OR = 3.11, 95% CI [0.24-1.13]). The most common risk factor was primigravida parity, which accounts for 5.2 times compared to multigravida (95% CI [0.58-1.05]). The second stage labour duration of ≥1 hour in primigravida was found to be more common than the second stage labour duration of <1 hour (OR = 0.93, 95% CI [0.80-1.04]). Episiotomy was more often performed with OR = 4.83, 95% CI (0.33-0.39), birth weight of fewer than 4000 grams was more commonly found than a birthweight of more than 4,000 grams (OR = 0.90, 95% CI [0.90-1.03]).

Table 2. Bivariate Analysis of the Association between Age, Parity, Duration of Labor, Episiotomy, and newborn's Birthweight towards Postpartum Urinary Retention

Study Variable	Yes	%	No	%	OR (95%CI)	*P-value*
Age (y o)						0.39
>35	28	90.3	3	75	3.11 (0.24-1.13)	
<35	3	9.7	1	25		
Parity						0.02
Primigravida	26	92.9	5	71.4	5.2 (0.58-1.05)	
Multigravida	2	7.1	2	28.6		
Duration of the second stage of labour in primigravida (hour)						0.00
>1	28	87.5	3	100	0.93 (0.80-1.04)	
<1	4	12.5	0	0.00		
Episiotomy						0.01
Yes	29	90.6	2	66.7	4.83 (0.33-0.39)	
No	3	9.4	1	33.3		
Newborn birthweight (gr)						0.11
>4,000	0	0.00	30	11.8	0.96 (0.90-1.03)	
<4,000	1	100	4	88.2		

Table 3. Multivariate Analysis of the Association between Age, Parity, Duration of Labour, Episiotomy, and Newborn Birthweight towards Urinary Retention

Subject Characteristics	OR (95%CI)	*P-value*
Age (y o)		
>35	1.20 (0.67-2.14)	0.19
<35		
Parity		
Primigravida	1.11 (0.42-0.63)	0.02
Multigravida		
Duration of the second stage of labour in primigravida (hour)		
> 1	0.93 (0.80-1.04)	0.01
< 1		
Episiotomy		
Yes	4.83 (0.33-0.39)	0.01
No		
Birthweight of newborn (gr)		
>4,000	0.35 (0.89-1.13)	0.10
<4,000		

Table 3 showed the multivariate analysis result of the association of age, parity, duration of labour, episiotomy, and birthweight with postpartum urinary retention in spontaneous labour. There were significant associations between episiotomy, duration of second stage labour, and primigravida, with postpartum urinary retention in spontaneous labour. Whereas age and birthweight were not significantly associated with postpartum urinary retention in spontaneous labour. This was shown in the risk factor of parity with OR = 1.11, 95% CI (0.42-0.63) with p-value of 0.02, and in episiotomy with OR = 4.83, 95% CI (0.33-0.39) with p-value of 0.01. Risk factor of age was OR = 1.20, 95% CI (0.67-2.14) with p-value 0.19. The risk factor of the second stage duration in primigravida was OR = 0.93, 95% CI (0.80-1.04), with a p-value of 0.01. Risk factor of birthweight was OR = 0.35, 95% CI (0.89-1.13) with p-value 0.10.

DISCUSSION

Pregnancy is marked by an alteration in some organs and organ systems. This alteration does not only occur anatomically, such as dilation of ureter and renal calyces but also functionally, such as the enhancement of glomerular filtration and urine output. During pregnancy, the bladder capacity is likely to adapt to functional alterations due to the enlarged uterine's compression, worsening as the gestational age gets older. During delivery, the bladder must also adapt to stretch and in urine production to prevent overdistention and facilitate the function of urine storage.[9,10]

We have found 27 patients (77%) with obstetric risk factors of age >35 years old and 8 patients aged <35 years old. Our multivariate analysis showed no significant association between age and postpartum urinary retention incidence with a p-value of 0.19. This result was similar to the study in 2019, which stated that there was no significant association between age and the incidence of postpartum urinary retention in spontaneous labor with a p-value of 0.99.[8]

In this study, postpartum urinary retention in spontaneous labor was more prevalent in primigravida patients, which were 21 patients (60%), and when associated with bivariate analysis, primigravida has a p-value of 0.02, OR = 5.2, 95% CI (0.58-1.05). This result shows that there was a significant association between primigravida and postpartum urinary retention. It also implies that postpartum urinary retention was more prevalent in primigravida than in multigravida. This result was also similar in 2002, which stated that postpartum urinary retention was more prevalent in primigravida than in multigravida (p<0.001).[11]

In this study, we also found a significant association between the duration of the second stage of labour in primigravida and postpartum urinary retention with a p-value of 0.02 OR = 0.93, 95% CI (0.80-1.04). This finding implies that postpartum urinary retention incidence was higher in patients with prolonged second stage labour. This condition is due to mechanical trauma in the bladder from such a long duration of labour or assisted vaginal delivery, which could cause trigonum edema and difficulty in voiding. Other mechanisms include mechanical trauma that could contribute to pelvic nerve injury, leading to the bladder's neurological impairment. Prolonged duration of second stage labour would cause prolonged stress on the pelvic floor, which causes pelvic tissue and nerve plexus injury, leading to outflow obstruction and "detrusor neuropraxia".[12] The study found a significant association between postpartum urinary retention and assisted vaginal delivery and labour duration of more than 700 minutes with a p-value of <0.001 and OR = 1.003, 95% CI (1.003-1.004).[13] The factors that affect postpartum urinary retention and found that every 10 minutes increase in second stage labour causes 6% increase in postpartum urinary retention risk, and every 1-minute increase in the interval between postpartum period and first spontaneous voiding could increase the risk of postpartum urinary retention by 4%.[14-16]

We also found that postpartum urinary retention incidence was more prevalent in patients who underwent episiotomy, which are 30 patients (86%). Bivariate and multivariate analysis showed that there was an association between postpartum urinary retention and episiotomy with a p-value of 0.01. We found that more subjects underwent episiotomy with OR = 4.83, 95% CI (0.33-1.04). This finding was due to pudendal nerve injury, which can cause afferent input to the bladder and interfere with relaxation reflexes of the pelvic floor and urethral sphincter.6 This study contrasts which stated that episiotomy and the laceration of the birth canal did not increase the incidence of postpartum urinary retention (p = 0.08) and (p = 0.44).[13,17,18]

Birthweight of more than 4000 grams occurred in 1 patient (3%), and birth weight of fewer than

4,000 grams occurred in 34 patients (97%). The bivariate and multivariate analysis results showed no association between birth weight and the incidence of postpartum urinary retention with a p-value of >0.025, OR = 0.96, 95% CI (0.9-1.03). Birthweight was one of the risk factors of postpartum urinary retention due to its role in causing traumatic damage to the bladder from the baby's head compression, although we did not find a statistically significant association in this study.[19,20] In 2019 also conducted this study and found that there was no association between birth weight and the incidence of postpartum urinary retention with a p-value <0.05.[8]

CONCLUSION

There were significant associations between obstetric risk factors (parity, duration of second stage labour, and episiotomy) with postpartum urinary retention in spontaneous labour. Whereas age and birth weight were not significantly associated with postpartum urinary retention in spontaneous labour.

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Case Report

Biopsychosocial Aspect of Pregnant Women Suspected Brainstem Death

Aspek Biopsikososial pada Perempuan Hamil dengan Kecurigaan Mati Batang Otak

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Abstract

Objective: Diagnosis of brainstem death and the vital organ function support in the pregnant woman to prolong gestation to attain fetal viability is still controversial. The decision is influenced by ethical and legal issue in the country. Another consideration is the hospital cost and health insurance coverage. This article purpose is to report a case and discuss the biopsychosocial aspect of this issue, so the doctors know how to decide a similar case.

Methods: We reported a suspected brainstem death in pregnant women and discussed the holistic approach.

Case: This case is a-38-year-old women, third pregnancy, 22 weeks of gestation, referred from the secondary hospital in a comatose condition. She was diagnosed with brainstem dysfunction due to intracranial mass and cerebral oedema. She wasn't diagnosed with brainstem death due to the electrolyte imbalance that can cause this condition. We did the multidisciplinary management approach. We decided the termination of pregnancy would only be performed if the fetus reaches 28 weeks of gestational age (with survival rate on perinatology is 31%). From the husband point of view, since the attending doctors have not declared the mother to be dead, then the husband still want to keep the mother in full life support. The patient and the fetus died on the 8th day of hospitalization. The patient was fully paid for by Indonesian Health Insurance.

Conclusions: Maternal brainstem dysfunction and brainstem death during pregnancy are rare. In Indonesia, ethical and legal consideration to keep both mother and fetus are appropriate with the general social, cultural, and religious values. However, we recommend managing every single case individually with an intensive multidisciplinary approach due to the possibility of the different personal value of the patient.

Keywords: brainstem dysfunction, brain death, pregnancy, fetal, ethic, legal.

Abstrak

Tujuan: *Diagnosis kematian batang otak dan dukungan fungsi organ vital pada perempuan hamil untuk melanjutkan kehamilannya sampai janin dapat hidup jika dilahirkan masih kontrovesi. Keputusan ini dipengaruhi oleh etik dan hukum di suatu negara. Pertimbangan lainnya adalah biaya perawatan rumah sakit dan cakupan asuransi kesehatan. Artikel ini bertujuan melaporkan sebuah kasus dan mendiskusikan aspek biopsikososialnya, sehingga para dokter dapat mengambil keputusan pada kasus lain yang serupa.*

Metode: *Kami melaporkan kasus perempuan hamil dengan kecurgaan kematian batang otak dan mendiskusikan pendekatan holistiknya.*

Hasil: *Kasus perempuan usia 38 tahun, kehamilan ketiga, 22 minggu, dirujuk dari rumah sakit sekunder dalam kondisi koma. Pasien didiagnosis dengan disfungsi batang otak akibat massa intracranial dan edema serebri. Pasien tidak didiagnosis dengan meti batang otak karena kondisi ini masih dapat dikarenakan gangguan keseimbangan elektrolit. Kami melakukan pendekatan multidisiplin. Diputuskan terminasi kehamilan akan dilakukan hanya jika janin mencapai usia kehamilan 28 minggu (dengan harapan hidup dari perinatology 31%). Dikarenakan dokter belum mengatakan pasien sudah meninggal, suami pasien menginginkan pasien dalam topangan alat. Pasien dan janinnya meninggal pada hari ke-8 perawatan. Pembiayaan pasien dengan menggunakan BPJS.*

Kesimpulan: *Disfungsi batang otak dan kematian batang otak selama kehamilan adalah kasus yang jarang. Di Indonesia, etik dan hukum yang berlaku untuk menjaga kehidupan ibu dan janin sesuai dengan nilai sosial, budaya, dan agama. Namun demikian, kami merekomendasikan mlakukan tata laksana setiap kasus secara individu dengan pendekatan multidisiplin dikarenakan perbedaan nilai pribadi pasien dan keluarga.*

Kata kunci: *disfungsi batang otak, etik, hukum, janin, mati batang otak, kehamilan.*

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INTRODUCTION

The irreversible of brainstem function implies the death of the whole function of the brain. The worldwide, continuing vital organ support when brain death has been diagnosed is generally unethical and futile.[1] However, to attain fetal viability, prolong gestation by continuing maternal somatic support is mandated.[1, 2]

The management of this case depends on the characteristic of the country. Indonesia has a point of view on ethical and legal issue. Another consideration is the hospital cost and health insurance coverage.[3] Biopsychosocial aspect of the every single patient is important due to the different personal and social value.

This paper discussed the biopsychosocial aspect of a pregnant woman with brainstem dysfunction, based on medical, ethical, social, and legal issues in Indonesia.

CASE

A 38-year-old woman was referred from the secondary hospital in a comatose condition. She had a history of increasing intracranial pressure symptoms for one week before admission (worsening of a headache and frequent projectile vomiting). She was diagnosed with a decrease of consciousness due to intracranial mass with brainstem dysfunction. The CT scan results were heterogeneous lesion in the left cerebellum hemisphere, suspected mass with multiple intra-parenchymal and subarachnoid bleeding focus, non-communicating hydrocephalus, bilateral trans-tentorial and tonsillar oedema and cerebral oedema. On laboratory results found normocytic normochromic anaemia and electrolyte imbalance. From the ultrasound, the fetus was still in good condition, corresponding to 22 weeks, the fetal weight was 579 grams. This patient was admitted to the ICU with maximal support. On the 8th day of admission, the patient was died due to infection.

We do the multidisciplinary management approach to this patient (in collaboration with the Department of Neurology, Anesthesiology, Obstetrics and Gynecology, Clinical Nutritionist, Perinatology, and Ethic-Medicolegal). The medical team provided cardiorespiratory support to reach the viability of the fetus according to the patient's husband and family.

The neurologist was consistent with "brain stem dysfunction", which requires further criteria for validation as "brainstem death". The term brainstem death can only be validated in a normal physiologic condition of the body, so it cannot be validated yet in this patient due to the presence of abnormal laboratory parameter like an electrolyte. The prognosis of the mother was poor, with very small chance of continuation of life with full assistance to even do basic daily activities.

Termination of pregnancy would only be performed if the fetus reaches 28 weeks of gestational age. The survival rate on perinatology is 31% of the baby at that gestational age. While awaiting further assessment by a neurologist, the somatic function of the mother would be sustained to provide life for the fetus, unless the family asked otherwise.

From the husband point of view, since the attending doctors have not declared the mother to be dead, then the husband still want to keep the mother in full life support. As for the prospect of the fetus, the husband is concerned about the uncertainty of the health condition of the fetus in the future. He still had to take care and provide for his other two children. The patient's husband is a private employee with a salary of 4 million per month.

DISCUSSION

Medical Aspect

Numbers of etiologies are causing brain death condition. Increasing intracranial pressure (ICP) due to injury is the cause. It increases the rate and degree of the cerebrospinal fluid shunt out of the cranium, such as acute haemorrhage, hypoxic-ischemic encephalopathy and metabolic disturbances (eg, liver failure). Increasing ICP accompanied by brain herniation downward through the foramen magnum, compressing and herniating the brainstem.[1]

The medical issues as an obstetrician in a caring patient like this are supporting the mother's somatic function and delivering the baby. Successful prolongation of the maternal somatic function is still no data. The duration of time required to attain fetal viability is the main success factor.[1] It needs all of the systems supports: cardiovascular, respiratory support, endocrine, thermoregulation, nutritional, infection prevention, and prophylactic anticoagulant.[4,5] Golden time to deliver the baby is 32 to 34 gestational weeks. The neonatal survival rate

before 24 weeks is 20% to 30%, with a probability of getting severe neurological disorders in 40% of neonates.[3]

There is a poor chance of the baby's survival in this case (less than 30% from the perinatology and literature data). But maternal support and maintenance of pregnancy were based on the diagnosis of brainstem dysfunction in this case, still not a brainstem death. Maintenance of mother's hemostasis and infection prevention was done.

Psychosocial and Legal Aspect

In this case, the husband and family want to keep both the mother and fetus in full support. Until the fetus attains viability. This shows the psychological aspect of the husband and family that want to do support as maximal as they can. But in ethical, legal, and economical issue, there are still controversies.

The consideration of prolonged somatic support for mother with brain death or brain dysfunction to attain fetal viability is ethical only if there is some hope of success.[1] In respecting the mother's autonomy to die with dignity, some professional do not agree with this issue.[1, 2, 6] Attributing the fetal right to use the mother's body as a cadaverous incubator is a reason from professionals that agree to somatic support.[2] As FIGO Committee for the Ethical Aspects of Human Reproduction and Women's Health opinion, a medical professional should prioritize the mother's right first as a patient, then the fetus: ''Women have the right to die in dignity. The goal of fetal rescue does not exonerate healthcare givers from the duty to respect this right of the primary patient – the woman"[7]

For the legal issue worldwide, given that the mother is legally dead, in strictly legal terms, her rights are no longer of relevance. The legal rights conferred on the fetus are closely linked to the maternal right to therapeutic abortion if still alive generally depends on gestational age.1 Maintaining the somatic function of the mother would be considered futile therapy and would not be permitted in Ireland's rule.[8] Therefore when there is just a little likelihood ratio of neonatal outcome, it will be no legal imperative to continue maternal somatic support.[1]

The recommendations to deal with the medical, ethical, and legal dilemmas. The recommendations are: if pregnancy is <24 weeks of gestation, no life support should be offered to the mother and the fetus. In pregnancy 24 to 28 weeks of gestation, intervention is possible but should be undertaken only after intense education and consultation with the surrogate and family members. And if the pregnancy has reached 28 weeks, it should be sustained until fetal maturity is attained or worsening of maternal condition necessitates delivery.[9, 10]

Facing the Patient's Biophysical Aspect in Indonesia

Maybe almost all people in Indonesia has the same value as this patient's family. It is influenced by the educational background, social and economic status, also religion.[2] Almost all religion believes life must prevail over all things. Islam and also Catholic ethics presume a human fetus at every stage to be a person possessing a right to life.[3, 11, 12] But the specific issue of fetal life in mother with brainstem death isn't reviewed.

For diagnosing brainstem death, it should be limited to the criteria according to Indonesian rule: it should be done by three doctors including an anesthesiologist and neurologist, the doctors do the examination at the separate time, and the diagnosis is made in the ICU. Brainstem death examination should be done in several conditions: unresponsive comatose (GCS 3), no gesture abnormalities (decortication or decerebration), no uncoordinated movement or epileptic, any irreversible structural brain damage that causes comatose or apnea, and no other causes of comatose or apnea (ie drugs, intoxication, metabolic disease, and hypothermia). Cranial nerves test and apnea test are the standards of brainstem death diagnosis.[13] The Neurologist diagnosed this patient with irreversible brainstem dysfunction, but no "a death" due to electrolyte imbalance in this case.

After the diagnosis was made by the Neurologist, the pregnancy issue is coming to the obstetrician. In Indonesia, there was no specific ethical issue of this case, maybe due to the rare case like this that be reported and reviewed. However, as we can see, in the General, Medical Ethic of Indonesia that the doctors should preserve every life, from the fetal phase and also patient autonomy.[14] It considers either the mother or the fetus has the same rights to life. The rule of termination of pregnancy could be done if only there is a worsening of the mother if continuing the pregnancy or worsening of viable fetus condition.[15] In this case, the decrease

of consciousness was caused by the intracranial mass process. It was different from the circulation process that can be worsened by the pregnancy, so the pregnancy was continued.

Economic problems also an important consideration. Indonesia health insurance's budget for the critically ill patient with long term ventilation in the tertiary hospital approximately 150 million rupiahs ($ 11.000) for one episode of hospitalization.[13] It needs consideration of the hospital management for the patient in this case due to the unlimited day of care. In a paper (1996), to maintain a pregnant woman with vegetative state 14 to 31 weeks, reported $200,000 as of the total cost of somatic critical care support, neonatal intensive care, and possible lifelong support of a neonate delivered with special needs. In caring the neonate up to 5 months of age, added by $100,000.[3]

Due to the specific condition of each case, the decision must be made by specialists, in conjunction with the pregnant woman's family members.[2] It much better if the multidisciplinary approach is applied in this situation.

CONCLUSION

Maternal brainstem dysfunction and brainstem death during pregnancy are rare. The biophysical aspect in caring for the patient in this condition had been described in our case. In Indonesia, ethical and legal consideration to keep both mother and fetus are appropriate with the general social, cultural, and religious values. However, we recommend managing every single case individually with an intensive multidisciplinary approach due to the possibility of the different personal value of the patient.

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Case Report

Anemia in Pregnancy as a Predisposing Factor of Severe Preeclampsia

Anemia dalam Kehamilan sebagai Salah Satu Faktor Predisposisi Preeklamsia Berat

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Abstract

Objective: This case may partly explain that anaemia can be a predisposing factor for the development of many women with preeclampsia were have a low level of haemoglobin during their pregnancy.

Methods: A case report

Case: We present a case 23-year-old pregnant woman who has had moderate anemia with severe preeclampsia at 38-week pregnant. As the evidence, there were elevated blood pressure, decreasing haemoglobin obtained by routine blood analysis, and presence of urine protein by urinalysis examination.

Conclusions: In terms of anemia as one of a predisposing factor of preeclampsia it is important to care provider, pregnant women, and families to prevent anemia in pregnancy through routine ANC.

Keywords: anemia, pregnancy, severe preeclampsia.

Abstrak

Tujuan: *Kasus ini sebagian dapat menjelaskan bahwa anemia dapat menjadi faktor predisposisi bagi perkembangan banyak perempuan dengan preeklamsia yang memiliki kadar hemoglobin yang rendah selama masa kehamilan mereka.*

Metode: *Laporan kasus.*

Kasus: *Kami melaporan kasus ibu hamil berusia 23 tahun yang mengalami anemia sedang dengan preeklamsia berat di usia 38 minggu, dibuktikan dari peningkatan tekanan darah, penurunan hemoglobin, serta protein uria pada pemeriksaan urinalisis.*

Kesimpulan: *Berkaitan antara anemia sebagai predisposisi preekalmsia, penting bagi petugas kesehatan dan ibu hamil serta keluarga untuk mencegah anemia dalam kehamilan melalui ANC yang rutin.*

Kata kunci: *anemia, kehamilan, preeklamsia berat.*

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INTRODUCTION

Anemia in pregnancy is a common problem that can occur in developed and developing countries. In 2015 the World Health Organization (WHO) published that 83.2% of pregnant women globally are anemic, while in Indonesia alone is estimated anemia can occur in 30% of pregnant women.[1]

The deficiency of micronutrients such as folic acid and iron is the most common aetiology of anaemia in pregnant women. Increased nutrients transfer from maternal to fetal causes maternal depleted in micronutrient reserves which serve as primary substances for erythropoiesis.[2] Based on scientific studies, anemia is associated with maternal mortality and morbidity due to broadly 20% of maternal deaths caused by anemia,[3] except that in the process of pregnancy, anemia can lead to other problems indicated one of them is preeclampsia. Preeclampsia is one of the problems of maternal and perinatal, especially in developing countries. Although it has the distinction of variation between countries, the incidence rates of preeclampsia are estimated to reach 1.8% - 16.7% of all pregnant women in The world.[4,5] Indonesian Demographic Health Survey in 2013, approved that preeclampsia is at the second position (27.1%) of the five causes of maternal deaths in Indonesia aside from haemorrhage, infection, and other abortions.[6]

In matters relating to preeclampsia, there is still much research done to further assess the relationship between both of them. The effect of anaemia on preeclampsia is still being debated by experts to be approved.[4] Therefore, on this occasion the researchers present the case of suspected anaemia predisposes to severe preeclampsia.

METHODS

Descriptive research of case reports. Primary data obtained by history and physical examination. Secondary data were obtained based on the results of laboratory and medical records. The study was conducted in the month of October 2017.

CASE

A 23-year-old woman who was 38+2 weeks pregnant (Gravid 1, Para 0) came to the emergency department at City Hospital. The patient had her routine antenatal care (ANC) at a community health clinic in her district as her first tier health facility. In her 38 weeks of pregnancy, the patient discovered that she had high blood pressure as per told by the midwife. She had never high blood pressure during prior ANC. The patient denied complaints of headache, blurred vision, heartburn, and convulsions. Patients also have no history of hypertension or heart disease. At her routine ANC, Iron and folic acid supplements were given by the midwife which the patient had never consumed. There were no prior kidney injury on this patient.

On a physical examination, the patient presented with blood pressure of 160/110 mmHg, pulse rate of 84 beat per minute respiration rate at 22 breaths per minute, and temperature at 36,7 °C. The patient fundal height is at 34 cm with fetal back in the left maternal side, fetal heartbeat is at 140 beat per minute, and there was no contraction occurred. Laboratory findings were normal except haemoglobin which at the level of 7,3 g/dl and a qualitative test of proteinuria which showed at +4. Morphological examination of red blood cells showed normocytic and normochromic erythrocyte. The patient was diagnosed as anemic with severe preeclampsia at a 38-week pregnancy. Further management included has observation of vital signs and labour progress, stabilization with parenteral fluid and MgSO4 administration 4 gr loading dose and 5 gr intramuscular of maintenance at each right and left gluteus, urinary catheter, oral nifedipine 10 mg every 8 hours, cardiotocography examination for monitor fetal wellbeing and induction of labour with misoprostol 1/8 tablet every 4 hours. Stage two labour decided to be assisted with extraction vacuum management. Communications, information and education were provided to the patients and families about the potential complications. The prognosis of this patient was dubia.

DISCUSSION

The patients were diagnosed through steps anamnesis, physical examination and laboratories investigations. The patient was a women with obstetric status Gravid 1, Para 0 expected full-term pregnancy, according to calculations First Day of Last Menstrual (DLM). Williams 24th edition states of gestation between $37^{1/7}$ to $41^{6/7}$ weeks is included in the full-term pregnancy, Further anamnesis obtained information that the patient's routine did the ANC, but didn't consume folic acid and iron tablets from the midwife. As additional information in the end of full-term pregnancy, the patient had increased blood pressure.[7]

On Physical examination, the patient had 160/110 mmHg blood pressure with a pulse, respiratory rate and temperature within normal limits. Based on recent guidelines, diagnosis of severe preeclampsia can be made by at least one of six criteria which are systolic blood pressure ≥ 160 mmHg, hepatic failure, progressive renal insufficiency, cerebral dysfunction, pulmonary oedema, and trombocytopenia.[8] In this case, the patient blood pressure was at 160/110 mmHg with other parameters of vital sign within normal limits. Qualitative test of proteinuria resulted at +4 level of proteinuria. Two criteria were already fulfilled by the patient. Thus, the patient was diagnosed as severe preeclampsia. To be precise this case is a late-onset preeclampsia because it occurs at gestational age at more than 34 weeks.[9] This is proven by the documentation in the patients ANC record. The patient blood pressure was normal until the gestational age of 38 weeks.

The diagnosis of anemia is made by a laboratory finding of haemoglobin at the level of 7.3 g/dl. The patient also admitted that she did not consume any of the antenatal supplements such as folic acid and iron. Within this haemoglobin level patient was pronounced

to have moderate anemia (Hb 7-9.9 g / dl) which is belong to anemia with normochromic normocytic erythrocyte morphology.[2]

Preeclampsia can induced anemia by mechanism of the red blood cells become fragmented as it passes through the blood vessels with damaged endothelium cells and fibrin, it causes hemolytic anemia. Damage to the blood vessels will lead to the use of platelets so that the number of platelets in the blood decreases. If the mechanism continues, are likely to be an increase in lactate dehydrogenase (LDH), followed by apoptosis and necrosis of hepatocytes cells, characterized by elevated liver enzymes (HELLP Syndrome).[10] In this case we found that LDH in the normal range for pregnancy with there were no either elevated liver enzyme or renal insufficiency, so that hemolytic anemia caused by preeclampsia can be ignored.

During pregnancy, there is a disproportionated increase in plasma volume, red blood cell volume, and haemoglobin mass. The plasma volume is higher than the level of red blood cells which leads to hemodilution.[11] This makes adequate iron intake is required during pregnancy from both additional supplements or food daily.[12] Micronutrient deficiency anaemia results in an increase in serum norepinephrine concentration, thus inducing the synthesis of corticotropin-releasing hormone (CRH) produced by the placenta, this condition enhances CRH stimulation resulting in increased inflammatory cytokines, glucocorticoids, oxidative stress.[9] Increased oxidative stress stimulates angiotensin receptor 1-autoantibodies (AT1-AAs). The formation of AT1-AA will induce sFlt-1 and sEng that bind to the vascular endothelial growth factor (VEGF) and placental growth factor (PlGF).[13] This condition leads to systemic vascular dysfunction resulting in an increase in blood pressure characterized by decreased Nitric Oxide (NO) and elevated endothelin. Hence, the finding of proteinuria.[14]

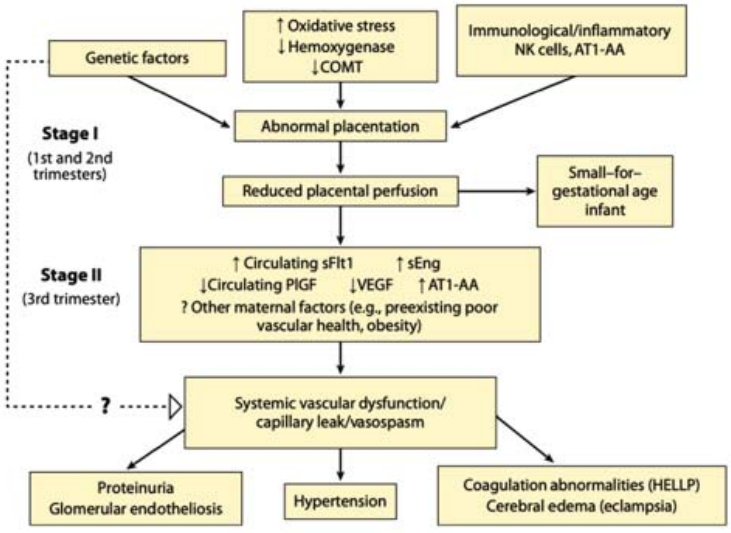

Figure 1. Summary of the pathogenesis of preeclampsia[11]
Micronutrient deficiency anaemia is included in the normocytic erythrocyte anaemia

CONCLUSION

type. A study conducted by Karaoglu et al (2010) stated that anemia due to micronutrient deficiency of folic acid can cause macrocytic anemia and iron deficiency causes microcytic anemia. But when folic acid deficiency occurs simultaneously with iron deficiency this results in normocytic erythrocyte. This type of micronutrient deficiency anemia basically causes the number of MCV exceeds normal level which explained why the morphologycal examination showed normal size of the erythrocyte.[3,15]

Anemia in pregnancy often occurs because of a deficiency of folic acid and iron micronutrients. Thus deficiency can lead synthesis of CRH as a basic mechanism of elevated blood pressure. A routine ANC visit could be a scheme to prevent the occurrence of micronutrient deficiency. In terms of its association with preeclampsia, anemia is thought to have a role as the cause of the emergence of preeclampsia, therefore it is important to care provider, pregnant women, and families to prevent anaemia in pregnancy.

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Literature Review

Neutrophil to Lymphocyte Ratio in Preeclampsia

Rasio Neutrofil terhadap Limfosit pada Preeklamsia

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Abstract

Objective: To determine the correlation between neutrophil to lymphocyte ratio and preeclampsia. To determine whether neutrophil to lymphocyte ratio can be used as a screening tool for preeclampsia.

Methods: This study was conducted with a systematic review method. Articles that had been gathered and filtered were reviewed by QUADAS-2 tool. Guidelines from the American Congress of Obstetricians and Gynecologists (ACOG) and Pedoman Nasional Pelayanan Kedokteran were used as a diagnostic criteria for determining preeclampsia.

Result: Studies conducted by Kirbas et al, Cakmak et al, Wang et al and Panwar et al stated that there is a correlation between neutrophil to lymphocyte ratio to preeclampsia (p-value < 0.05). Cut-off values are diverse between 3.5 - 5.6 with different sensitivity and specificity.

Conclusions: This systematic review shows that there is a relationship between neutrophil to lymphocyte ratio and preeclampsia. Neutrophil to lymphocyte ratio can be used as screening tools for preeclampsia in the first trimester.

Keywords: neutrophil to lymphocyte ratio, NLR, preeclampsia.

Abstrak

Tujuan: *Mengetahui apakah terdapat hubungan antara rasio neutrofil terhadap limfosit dengan preeklampsia. Mengetahui apakah rasio neutrofil terhadap limfosit dapat dijadikan sebagai alat bantu skrining preeklampsia.*

Metode: *Penelitian ini dilakukan dengan metode systematic review. Artikel yang disaring akan ditentukan kualitasnya menggunakan QUADAS-2. Kriteria diagnostik preeklampsia yang digunakan adalah American College of Obstetricians and Gynecologists (ACOG) untuk penelitian luar negeri dan Pedoman Nasional Pelayanan Kedokteran untuk penelitian dalam negeri.*

Hasil: *Penelitian yang dilakukan oleh Kirbas et al, Cakmak et al, Wang et al, dan Panwar et al menyatakan bahwa terdapat hubungan antara rasio neutrofil terhadap limfosit dengan preeklampsia (p-value < 0.05). Nilai cutoff dari rasio neutrofil terhadap preeklampsia beragam mulai dari 3.5 - 5.6 dengan sensitivitas dan spesifisitas yang berbeda-beda.*

Kesimpulan: *Penelitian systematic review ini menunjukan bahwa rasio neutrofil terhadap limfosit memiliki hubungan dengan penyakit preeklampsia. Rasio neutrofil terhadap limfosit dapat dijadikan sebagai alat bantu skrining untuk preeklampsia pada trimester pertama.*

Kata kunci: *rasio neutrofil terhadap Limfosit, NLR, preeklamsia.*

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INTRODUCTION

Maternal mortality rate is still an issue in many countries. At least 830 women die every day caused by pregnancy and labour. World Health Organization (WHO) claimed 99% death comes from developing countries. In 2015, WHO claimed 303.000 women died during and after pregnancy or giving labour. In the same year, Indonesia sets the target for maternal mortality rate to 102 deaths per 100,000 births. Indonesia in 2015, recorded 305 deaths per 100,000 births and hypertension is the second caused of maternal death.[1-3]

Hypertension in pregnancy is a concerning condition because it can increase morbidity or mortality of the mother or the fetus. This condition also one of the criteria to diagnose preeclampsia. Preeclampsia is a condition marked by high blood pressure and proteinuria and begins after

20 weeks of pregnancy. It is often affected other organs of the pregnant woman. Ten million women suffer preeclampsia every year around the world and up to 76,000 pregnant women die caused by preeclampsia or other hypertension causes.[4-5]

The aetiology of preeclampsia remains unknown. A theory stated that there is an endothelial leakage caused by endothelial dysfunction. When a woman suffers preeclampsia, there will be a secretion of inflammatory cytokines and it will cause endothelial dysfunction which leads to endothelial leakage. When endothelial dysfunction occurs, it is presumed there will be a neutrophil activation that leads to a further endothelial dysfunction.[6]

The neutrophil to lymphocyte ratio can be used to predict preeclampsia and stated that both variables correspond to each other. A study states that the ratio of neutrophils to lymphocytes can be used to detect preeclampsia. However, there are other studies that suggest that the ratio of neutrophils to lymphocytes is not compatible with preeclampsia.[7-9]

Preeclampsia remains a big problem in Indonesia and still donates a significant amount of maternal mortality rate. The aetiology of preeclampsia remains unclear, but there is a theory that stated that there is a correlation between preeclampsia and neutrophils which is supported by the studies above. Considering the urgency of preeclampsia, and to learn further about the correlation between preeclampsia and neutrophil to leukocyte ratio, we are interested in doing this study.

METHODS

This was a systematic review study. Subjects were pregnant women with preeclampsia or severe preeclampsia that had been diagnosed based on ACOG or PNPK criteria. The total population included in this systematic review is 1977 women. Studies from Pubmed, Proquest and EBSCO were included in this study.

The inclusion criteria were every study that is related with neutrophil to lymphocyte ratio and preeclampsia along with p-value, sensitivity and specificity. Studies conducted over the last 5 years and use ACOG or PNPK criteria. The exclusion criteria were studies with only title nor abstract studies using other than English or Bahasa.

The studies that had been gathered will be sorted and filtered based on the inclusion and exclusion criteria. Studies that were included will be reviewed using QUADAS-2 tools to appraise its study.

RESULTS

Studies Quality

Table 1. Risk of Bias QUADAS-2

Studi	Patient Selection	Index Test	Reference Standard	Flow and Timing
Kirbas, 2015	Low	Low	Low	High
Cakmak, 2017	Low	Low	Low	Low
Wang, 2019	Unclear	Low	Low	Low
Panwar, 2019	High	Low	High	Low

Interpretation: there were few high and unclear risk of the studies conducted in this study.[8,10-12]

Table 2. Applicability Concerns QUADAS-2

Studi	Patient Selection	Index Test	Reference Standard
Kirbas, 2015	High	Index	Low
Cakmak, 2017	Low	Low	Low
Wang, 2019	Low	Low	Low
Panwar, 2019	Low	Low	Low

Interpretation: most studies applicable to the study.

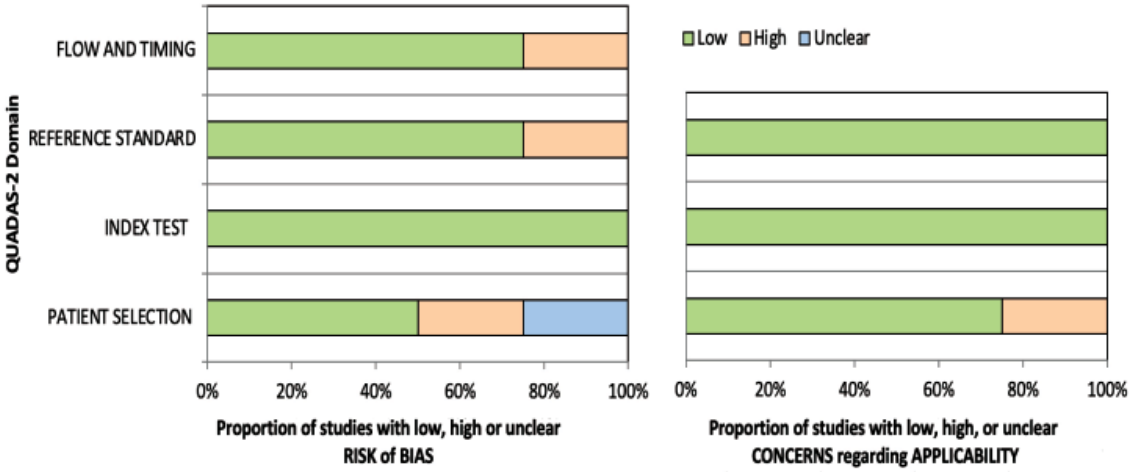

Figure 1. QUADAS-2 Risk of Bias and Applicability Concern.
A stacked bar graphs of studies that were being appraised by QUADAS-2.

Table 3. Studies characteristics

Studi	Year	Country	Age	No. P/K	Criteria	Cut off	*P-value*
Kirbas	2015	Turkey	PE: 29.3 ± 14.3 SPE: 27.9 ± 4.9	614/ 320	ACOG	4.01	p < 0.001
Cakmak	2017	Turkey	PE: 27 ± 6 SPE: 27 ± 5	100/40	ACOG	3.5	p < 0.001
Wang	2019	China	PE: 27.7 ± 4.14 SPE: 28.2 ± 4.62	302/161	ACOG	4.19	p < 0.01
Panwar	2019	India	-	64/376	ACOG	5.6	p < 0.001

No. P/C = Number of Patient/ Control, PE = Preeclampsia, SPE = Severe Preeclampsia
Interpretation: p-value of all studies are significant.

Neutrophil to Lymphocyte Ratio

All of the studies taken showed a significant correlation between NLR and preeclampsia (p-value < 0.05). There are studies conducted in Turkey, China and India. Every study has its own subjects characteristic and the population taken is diverse between each study. Each study has its own sensitivity and specificity of NLR cutoff taken and preeclampsia.

DISCUSSION

Preeclampsia is part of hypertension in pregnancy and it is one of the most prominent because of its impact on maternal mortality and perinatal mortality around the world. Preeclampsia is a condition marked by high blood pressure and proteinuria and begins after 20 weeks of pregnancy. Preeclampsia can be accompanied by headache, temporary vision loss, blurred vision, abdominal pain, nausea or vomiting, oliguria, thrombocytopenia, liver dysfunction and shortness of breath.[13]

There are few theories about the pathogenesis of preeclampsia, one theory stated that preeclampsia is caused by the failure of spiral artery remodelling which results in endothelial dysfunction. The syncytiotrophoblast that starved of nutrients and oxygen, reacts by releasing highly inflammatory microparticles into the maternal circulation. These particles have been proposed to contribute to endothelial dysfunction. The endothelial dysfunction will activate neutrophil to make further damage.[14-15]

Based on the results above, all the studies

concluded that there is a correlation between NLR and preeclampsia. One study showed that the NLR correlate with the development of the preeclampsia. The same results can be seen concluded that higher value of NLR in the first trimester can be a predictor for preeclampsia. High NLR can be used to become a diagnostic tool for preeclampsia.[16-17]

This shows that preeclampsia has a relation with the neutrophil and lymphocyte. The increasing NLR value shows that systemic inflammation and endothelial dysfunction are present. This occurs via an interaction of endothelial adhesion molecules and surface receptors on the neutrophil. When the neutrophil activates, granules will be released, and it can mediate vascular damage. Leukotriene will also be synthesized, and superoxide will be generated. Both of these will provoke vascular damage. The mechanism of neutrophil activation remains unknown, but there is a potential mechanism of neutrophil activation has been identified.[18]

The studies also showed various cutoff ranging from 3.5 - 5.6 which every study has its own sensitivity and specificity. This is caused by the differences between each study. The diverse of the population taken from each study is different and the place that the study takes also differs from one another. The studies shows that the specificity of NLR to preeclampsia is over 80% which indicates that it can be used as a screening tool for preeclampsia in the early pregnancy.

CONCLUSIONS

In conclusion, this study shows that there is a correlation between neutrophil to lymphocyte ratio and preeclampsia. Every study that was taken shows that there is a significant p-value for NLR and preeclampsia. Neutrophil to lymphocyte ratio also can be used as a screening tool for defining preeclampsia.

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