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Characteristics of high-risk pregnancy in Sanglah General Hospital 2011-2014

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ABSTRACT

Background: Pregnant women with a high-risk pregnancy are women with increased risk in pregnancy or childbirth. There is no readily available data available about the characteristics of the high-risk pregnancy in Bali.

Objective: Our study aimed to provide a data, to be the base of Sanglah General Hospital resource planning to reduce maternal mortality and morbidity.

Method: This was an observational study using medical records of high risk pregnancy patients at Sanglah General Hospital from 2011 to 2014.

Result: Over the 4 year study period at Sanglah, there were 1027 high-risk deliveries in 2011, 1590 in 2012, 1590 in 2013, and 948 in 2014. In 4 years, there were 748 patients 35 years and older. The majority were in the age group of 26-30 year. There were 2932 multiparous. Overall, 3082 were multigravida and 197 were grandemultipara. There were 1406 preterm labours. By onset and mode of delivery, 2027 (41.50%) had a caesarean section, 9 (0.18%) breech deliveries. The neonatal outcome was 296 (6.29%) moderate asphyxia, 2189 (4.63%) severe asphyxia. The were 197 (3.82%) twin pregnancies and 5 (0.1%) cases of triplets. The largest group of obstetrics complications in Sanglah hospital was premature rupture of membrane (1652 cases or 30.99%). The most common medical disorder of pregnant women at our hospital was anemia (353 cases or 45.43%). The most prevalent congenital anomalies were multiple congenital abnormalities (18 infants or 20.22%).

Conclusion: There was a high number of high-risk pregnancies delivered at Sanglah, which 46.85% of it being a high risk delivery. The characteristics of the high-risk pregnancies can be used to plan an appropriate care to reduce the maternal mortality rate.

Keywords: High-risk pregnancy, maternal mortality, Sanglah General Hospital

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INTRODUCTION

Pregnant women with a high risk pregnancy are women with maternal risk factors such as previous pregnancies with a history of miscarriage, bleeding after birth, stillbirth, thin or underweight, having had four children or more, the time between two pregnancies being less than two years, anemia, bleeding in pregnancy, elevated blood pressure and severe headache and swelling of the legs, abnormal location of the fetus or the mother's pelvis abnormal shape, history of chronic diseases such as diabetes, high blood pressure, asthma and others.[1]

Indonesia is one of the countries with the highest maternal mortality rate (MMR) in Asia, at 228/100,000 live births in 2007, while the target of the National Medium Term Development Plan is 226/100 thousand live births.[2] Almost all maternal deaths in Indonesia is a result from a high risk pregnancy. The three main factors causing maternal mortality are hemorrhage, hypertension or preeclampsia during pregnancy, and infection. Postpartum hemorrhage is the leading cause of maternal death, at about 28%.[3] The next are are eclampsia (24%), infection (11%), abortion (5%), obstructed labor/loss (5%), obstetric embolism (3%), obstetric trauma (5%), puerperal complications (8%), and others (11%).[4]

Sanglah General Hospital is the largest hospital in Bali, and is classified as a national referral grade A hospital. Therefore, it accepts high-risk pregnancy referral from all district hospitals in Bali, and from some parts of Eastern Indonesia. Because of the improved triage processes and active networking, the number of referral is increasing each year.[5]

Basic health services provided through health centers need to be supported by Regional Referral Hospitals and the Provincial Referral Hospitals, which must be affordable and of high quality. The roleof the provincial government and district/city governments in helping to reduce maternal and infant mortality, is to facilitate the strengthening of human resources, the availability of medicines and medical equipmentby appropriate and well directed financial support, and the implementation of good governance at the regional and local level.[6]

The maternal mortality in Bali in 2013 was 72.1 per 100,000 live births and in 2014 was 48 per

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100,000 live births.[7] Data from the 2013 Bali provincial health profile suggests that the highest mortality rate was from from Bangli regency 160.8/100,000 live births, followed by Karangasem 125.8/100,000 live births and Gianyar 93.2/100,000 live births, withthe second lowest in the Denpasar Klungkung district at21.7/100,000 live births. Although the maternal mortality rate in most-provincesappear to be declining, the maternal mortality rate in Sanglah 2014 remains high, with up to 16 cases of maternal deaths/year, as most of the deaths in Sanglah Hospital are from appropriate high risk referrals from these provinces.

Services and resources available need to be managed to target to the causes of maternal deaths. Identification of which women are vulnerable and the causes of maternal deaths require a good medical record keeping by health workers, particularly in regards to high-risk pregnancy. This descriptive study is published to serve as a readily available data for health resource planner, and to understand the characteristics of high-risk pregnancy at Sanglah General Hospital. We aimed to provide the data to find the best solution in reducing the number of maternal deaths in hospitals.[8]

METHOD

This research is a descriptive study using secondary data from medical records, collected by the Obstetrics and Gynecology department, Faculty of Medicine, in conjunction with the teaching hospital, Sanglah General Hospital, from 2011 to 2014. The inclusion criteria were patients who have complete of medical record and the exclusion criteria was incomplete medical record. The data was obtained from a prospectively compiled database in a form of Microsoft Excel. It was compiled by the residents of the departments for the weekly morbidity and mortality meetings of the Maternal Fetal Medicine Department. The data is collated and tabulated into the form of tables and narrative using SPSS for Windows (version 16.0. Chicago, *SPSS* Inc).

Table 1 **Maternal Characteristics of High-Risk Pregnancy at Sanglah General Hospital in 2011-2014**

Maternal Characteristics	Year				Total	
	2011	2012	2013	2014		
	n	n	n	n	n	%
age						
< 35 year	895	1332	1363	817	4407	85.49
≥ 35 year	132	258	227	131	748	14.51
	1027	1590	1590	948	5155	100
parity						
nulliparous	441	668	680	434	2223	43.12
multiparas	586	922	910	514	2932	56.88
	1027	1590	1590	948	5155	100
Gravida						
Primigravida	362	569	579	366	1876	36.39
Multigravida	636	962	956	528	3082	59.79
Grandemultipara	29	59	55	54	197	3.82
	1027	1590	1590	948	5155	100

RESULTS

There was no missing data in this study. The 4-year study showed 1027 high-risk deliveries in 2011, 1590 in 2012 and the same in 2013, and 948 in 2014. The average of the high-risk pregnancy over the year period was 1289 deliveries/year. From the total of 5155 high-risk deliveries in the 4 years, 85.49% was under 35 years old and 14.51% over 35. The age group 26-30 was the most frequent (28.34%). By maternal parity, 43.12% was nulliparous and 56.88% was multiparous. As much as 59.79% was multigravida, 36.39% was primigravida, and 3.82% was grandemultipara.

The majority of the babies (72.73%) was delivered at term (≥37weeks) and 27.27% was born preterm (<37 week). While most presentation was cephalic (84.21%), 11.72% was breech, and 2.46% was transverse. From 5155 births, 46.33% was spontaneous, 41.50% by Caesarean section (C-section), 8.91% by forceps extraction (FE), and 2.48% by vacuum extraction. There were 9 cases of spontaneous breech deliveries, 16 cases of loveset mauriceau (assisted), and 13 cases of breech extraction.

The neonatal outcome was as follows: 89.08% was vigorous, 6.29% had asphyxia, and 4.63% had severe asphyxia. From 5,362 babies born, 96.08%

Table 2 **High-Risk Pregnancy by Age Group**

Age	2011	2012	2013	2014	total	
(in years)	n	n	n	n	n	%
10-15	1	2	5	4	12	0.23
16-20	113	179	182	125	599	11.62
21-25	236	374	374	227	1211	23.49
26-30	322	446	452	241	1461	28.34
31-35	223	331	350	220	1124	21.80
36-40	119	207	189	109	624	12.10
41-45	12	49	38	22	121	2.35
46-50	1	2	0	0	3	0.06
Total	1027	1590	1590	948	5155	100.00

Table 3 Other Characteristics of High-Risk Pregnancy at Sanglah General Hospital in 2011-2014

	Year					
	2011	2012	2013	2014	Total	
Characteristics	**n**	**n**	**n**	**n**	**n**	**%**
Gestational age						
Preterm (< 37 week)	279	399	390	338	1406	27.27
Aterm (≥ 37 week)	748	1191	1200	610	3749	72.73
	1027	1590	1590	948	5155	100.00
Presentation						
Head	863	1334	1348	796	4341	84.21
Transverse lie	26	34	40	27	127	2.46
Breech	127	196	178	103	604	11.72
Head-breech	10	22	20	14	66	1.28
Head-transverse lie	1	3	3	5	12	0.23
Breech-transverse lie	0	1	1	3	5	0.10
	1027	1590	1590	948	5155	100.00
Mode of delivery						
C-section	420	666	589	352	2027	41.50
Spontaneous	459	639	741	424	2263	46.33
Vacuum	29	48	34	10	121	2.48
FE	53	162	130	90	435	8.91
Bracht	6	2	1	0	9	0.18
LM	3	2	8	3	16	0.33
Total extraction	4	3	6	0	13	0.27
	974	1522	1509	879	4884	100.00
Birth Weight						
500g – 1000g	17	14	19	24	74	1.48
1000g – 2500g	250	418	385	269	1322	26.41
>2500g	732	1131	1145	601	3609	72.11
	999	1563	1549	894	5005	100.00
Apgar Score						
Severe asphyxia	62	59	40	57	218	4.63
Moderate asphyxia	64	82	100	50	296	6.29
Vigorous	806	1320	1326	741	4193	89.08
	932	1461	1466	848	4707	100.00
Number of Babies						
single	994	1527	1530	902	4953	96.08
gemeli	33	63	57	44	197	3.82
triplet	0	0	3	2	5	0.10
	1027	1590	1590	948	5155	100.00

was from singleton pregnancies, 3.82% was twins, and 0.1% was triplets.

Based on the categories of obstetric complications, 30.99% was premature rupture of membrane (PROM), 16.92% locus minorus resistantiae (LMR), 10.73% severe preeclampsia, 7.47% gestational hypertension, 5.16% mild preeclampsia.

The medical disorder complicating the high risk pregnancies were anemia (45.43%), asthma (11.97%), cardiac issues (9.78%), and HIV/AIDS (6.44%). The number of congenital anomalies in was 28 (2.73%) in 2011, 22 (1.38%) in 2012, 27 (1.70%) in 2013, and 12 (1.27%) in 2014. Most of the anomalies was recorded as multiple anomalies (20.22%), hydranchepali (14.61%), CTEV (10,11%), labiognatopalatoschizis (6.74%) and hydrops foetalis (5.62%).

DISCUSSION

Most of the high-risk pregnancy in Sanglah hospital was less than 35 years of age and multigravida. The largest age group was 26-30. This demographic pattern relates to the social norms in Indonesia, particularly in Bali, where it is common for women to marry and get pregnant at a relatively young age. The average age of marriage in Bali is relatively younger than the rest of Indonesia with a median of 21.9 years.[9]

As many as 2,027 had a C-section, or 41.5% of the total delivery in the 4 years. According to the World Health Organization, 54 countries with C-section under 10%, 10 countries 10-15%, and 69 countries above 15%.[10] However, our hospital is a high risk pregnancy referral centre. It means we have an inevitably high obstetric complication, which often require a medical treatment and different intervention levels compared to other centres.

Neonatal outcomes during the last 4 years showed 89.08% of babies was vigorous. Clinical management of high-risk maternity cases at Sanglah hospital uses defined consensus and evidence based clinical protocols/clinical guidance manual which has been utilised for many years and revised annually.[11]

Premature rupture of membrane (PROM) is the most common obstetric complication (25.02%). PROM is highly associate<mon potential pathogenic bacteria in pregnant women. Based on WHO recommendations, bacteriuria screening for GBS has been recommended by our institution, but not yet implemented.

The second highest complication rate was with LMR. The caesarean section rate in Indonesia, according to national survey data in 2007, was 921,000 of childbirth 4,039 million or approximately 22.8% of all deliveries.[12] The number of cases of pregnancy with scar tissue (LMR) in Sanglah was high because Sanglah is a referral hospital, receiving cases from health care facilities without

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Table 4 Mother Complications in High-risk Pregnancy

	Year				Total	
	2011	2012	2013	2014		
Complications	**n**	**n**	**n**	**n**	**n**	**%**
PROM	331	528	520	273	1652	30.99
IUFD	36	55	39	28	158	2.96
Dystocia	62	90	81	39	272	5.10
Neglected	9	17	22	7	55	1.03
Ante-Partum Bleeding	57	75	59	60	251	4.71
LMR	170	280	317	135	902	16.92
Low Height Mother (LHM)	43	56	46	37	182	3.41
Fetal Distress	25	62	72	32	191	3.58
Grande multipara	9	18	11	8	46	0.86
Oligohydramnios	19	31	34	26	110	2.06
Ureterovaginal fistula	0	0	1	0	1	0.02
Umb.cord prolapse	5	4	4	2	15	0.28
Cervical ca	0	1	0	0	1	0.02
Anhydramnios	5	4	3	0	12	0.23
Polyhydramnios	5	4	3	4	16	0.30
Mild Preeclampsia	39	82	105	49	275	5.16
Severe Preeclampsia	95	189	162	126	572	10.73
Eclampsia	13	21	15	15	64	1.20
Chronic Hypertension	7	12	15	7	41	0.77
Superimposed Preeclampsia	22	30	21	43	116	2.18
Gestational Hypertension	77	111	132	78	398	7.47
Total	1029	1670	1662	969	5330	100.00

an operating theatre. In 2001, the cesarean section practice in our hospital was 22.3 per 100,000 deliveries. Nevertheless, in 2006, it had increased to 34.6 per 100,000 deliveries.[12]

Severe and mild preeclampsia, and gestational hypertension, had also increased every year. The proportion of woman younger than 16 and over 35 was 19.7%, while the proportion between the age brackets was 80.3%. Based on the age, they are at low risk to develop preeclampsia. The high number of hypertension cases may be due to the improving referral system. Nearly 35% of cases of preeclampsia are referred cases from other districts or other health facilities within Denpasar. The major cause of mortality in Bali in 2013 was preeclampsia, with 10 cases of maternal death. The number of hypertension in pregnancy are contributing to annual maternal mortality. Initiatives such as uterine artery Doppler examination to detect "notching" on uterine artery may result in an early treatment (such as low dose aspirin) in at risk women. Such program may help to minimize maternal mortality due to hypertension or preeclampsia.

The most prevalent medical disorders in high-risk pregnancy was anemia. In 2013, it is suggested that 37% of pregnant Indonesian was anemic (hemoglobin levels of less than 11.0 g/dL). In the same year, the coverage of the first ANC in Bali, which covers anemia screening and intervention, was ranked the first of all districts in Indonesia.[13] However, these figures are in contrast to the high rate of anemia in pregnant women in Sanglah. We should explore whether there are other factors such as health care behavior (such as the acceptability of iron supplement), or dietary, and other cultural practice of the people living in Bali that may affect the incidence of anemia in pregnant women.

Pregnancy with HIV/AIDS is still a global issue that need to be prioritised by the Indonesian government. Because, until 2005 there were 859 new cases of HIV positive, and it increased to 21,511 in 2012, and to 22,869 in 2014.[14] From 55,799 known cases of AIDS, 1,506 cases was acquired through vertical transmission from mother to fetus.[15] This figure is a challenge for our health service. An effective screening for pregnant women to reduce vertical transmission, universal precaution including breastfeeding risk assessment, and selective caesarean section where appropriate, are necessary. Our hospital has implemented a screening system to by Provider-Initiated Testing and Counselling (PITC) since 2014. PITC is an HIV counseling and testing recommended by health care providers as a standard component of medical service when a client shows signs and symptoms of HIV infection. We expect an optimized case identification of mothers with HIV/AIDS so that the risk of vertical transmission can be reduced.

The number of congenital abnormalities within the four-year study was 89. The most frequent was multiple congenital abnormalities (18 cases). Multiple congenital abnormalities cannot be elaborated any further because of the data recording technique limitation. Most congenital anomalies at our hospital detected at birth due to the lack of screening. Cultural believes, as well as lack of awareness about the benefits of an anomaly scan may be the cause of this issue. Some congenital anomalies may not be able to be detected right away nor reported. These are anomalies such as congenital dislocation of the hip, skin lesions such as naevuses, non-clinically significant VSD, etc.

STUDY LIMITATION

This study only covers the characteristics of high risk pregnancy at one tertiary hospital (Sanglah Hospital) and required research involving various

Table 5 Medical Disorders in High-Risk Pregnancy

Medical disorders	Year 2011 n	2012 n	2013 n	2014 n	Total n	Total %
SVT	0	0	1	0	1	0.13
Heart disease	12	28	14	22	76	9.78
Asthma	28	25	29	11	93	11.97
Tuberculosis	2	1	1	0	4	0.51
HIV/AIDS	9	12	11	18	50	6.44
Hepatitis B	4	7	6	1	18	2.32
Condyloma	3	9	6	0	18	2.32
Grave dissease	0	2	0	0	2	0.26
Anemia	57	80	127	89	353	45.43
Lung oedema	2	2	1	2	7	0.9
SOL cerebri	2	1	0	0	3	0.39
Hyperthyroid	2	1	1	5	9	1.16
Herpez zoster	0	1	1	0	2	0.26
PDA	0	1	0	1	2	0.26
UTI	6	4	14	3	27	3.47
Leukemia	1	1	0	0	2	0.26
SLE	0	1	1	0	2	0.26
Polio	0	2	0	0	2	0.26
Diabetes	3	7	8	1	19	2.45
Trombocytopenia	3	4	7	8	22	2.83
Stroke	1	1	0	0	2	0.26
Nefrotic syndrome	1	1	1	0	3	0.39
Hypothyroid	0	2	1	0	3	0.39
Acute Pyelonephritis	1	2	1	0	4	0.51
ITP	0	1	0	1	2	0.26
Myoma	3	5	6	1	15	1.29
SNT (Euthyroid)	1	1	3	1	6	0.77
Chorioamnionitis	1	0	1	1	3	0.39
High Myopia	3	0	3	2	8	1.03
DHF	1	0	3	0	4	0.51
Ablatio Retina	2	0	0	0	2	0.26
Epilepsy	4	0	0	2	6	0.77
Varicella	2	0	0	0	2	0.26
Ca Cervix	1	0	0	0	1	0.13
Hemorrhoid	1	0	0	0	1	0.13
Obesity	0	0	2	0	2	0.26
Severe Obesity	0	0	1	0	1	0.13
Total	156	202	250	169	777	100

Table 6 Congenital abnormalities in infants in Sanglah General Hospital 2011 - 2014

Year	Number of baby with congenital anomaly	Number of delivery	congenital anomaly/ delivery
2011	28	1027	2.73
2012	22	1590	1.38
2013	27	1590	1.70
2014	12	948	1.27

Table 7 Number of Babies with Congenital Anomaly in Sanglah General Hospital 2011-2014

Congenital Anomalies	year '11 n	'12 n	'13 n	'14 n	Total n	Total %
Dextrocardia	0	1	0	0	1	1.12
Hydrancephaly	0	7	2	4	13	14.61
PDA	0	3	0	0	3	3.37
Hypospadias	1	1	0	0	2	2.25
Ventriculomegaly	1	1	0	0	2	2.25
Labiognatopalato-schyzis	1	2	3	0	6	6.74
Down Syndrome	1	2	0	0	3	3.37
Bell's palsy	0	1	0	0	1	1.12
Omphalocele	1	1	0	0	2	2.25
Hygroma colli	0	1	0	0	1	1.12
Heart dissease	0	1	0	0	1	1.12
Multiple Congenital Anomaly	6	1	8	3	18	20.22
Hydrops Fetalis	3	0	2	0	5	5.62
CTEV	8	0	1	0	9	10.11
Beckwith Wiedemann Syndrome	0	0	1	0	1	1.12
Anencephaly	1	0	1	0	2	3.41
Arthrogryposis	0	0	1	0	1	1.12
Achondroplasia	0	0	1	0	1	1.12
Acrania	1	0	0	0	1	1.12
Polidactilia Right Hand	1	0	0	1	2	2.25
Ambigous Genitalia	1	0	0	0	1	1.12
Phocomelia	1	0	0	0	1	1.12
Palatoschizis	0	0	1	1	2	2.25
Duodenal atresia	0	0	1	0	1	1.12
Dandy Walker malformation	0	0	1	0	1	1.12
Microcephaly	0	0	1	0	1	1.12
Meningocen-cephalocele	0	0	1	0	1	1.12
Amelia	0	0	1	0	1	1.12
Fetal Ascites	0	0	0	1	1	1.12
Patau Syndrome	0	0	0	1	1	1.12
Persistent pulmonary hypertension	0	0	0	1	1	1.12
Total	27	22	27	12	88	100.00

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hospitals in Bali that will describe the characteristics of high risk pregnancy in Bali.

CONCLUSION

The number of high risk pregnancies managed at Sanglah high, accounted for the 16 maternal deaths in Sanglah General Hospital. This data may facilitate the service and resource planning of our hospital. However this study did not reflect the characteristics of high risk pregnancy in Bali. A multi-center studies are required to describe the characteristics of high-risk pregnancy in Bali.

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