ARRHYTHMIAS IN PREGNANCY: A RETROSPECTIVE DATA IN WEST NUSA TENGGARA

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ABTSRACT.

Arrhythmia is when there is an abnormality in the heart rhythm that a disease or physiological factor can cause. Pregnancy is one of the physiological factors which can induce arrhythmia. During pregnancy, a person will tend to experience increased metabolic energy to meet the mother's and fetus's needs. This retrospective descriptive study was conducted at the Regional General Hospital of West Nusa Tenggara Province in Indonesia from January 2023 to December 2023. Arrhythmia sampling in pregnant women uses secondary data from a total sample of pregnant women at the Nusa Tenggara Barat General Hospital. These samples were analysed using the prevalence analysis formula. This study showed that out of 648 pregnant women, there were 8 (0.012%) pregnant women had arrhythmias with other types such as supraventricular tachycardia (SVT) 0.004%, AV Block 0.003%, premature atrial contraction (PAC) 0.001%, atrial flutter 0.001%, and atrial fibrillation 0.001%. In addition, 7 of the eight arrhythmias (0.01%) in pregnant women had been diagnosed with peripartum cardiomyopathy (0.001%), congenital heart disease (0.001%), congestive heart disease (0.004%), chronic hypertension (0.001%), and sepsis (0.001%). Early recognition of arrhythmia is significant in preventing morbidity and mortality in patients with pregnancy.

Keywords: arrhythmia, pregnancy, heart disease

1. INTRODUCTION

Arrhythmia is a heart rhythm disorder caused by secondary disorders such as extracardiac or other heart diseases, based on research by Laurentia Mihardja, the prevalence of heart disease in Indonesia in 2007 in the population aged more than 15 years reached 9.2% with 5.9% of them experiencing arrhythmia (Putri Al Syafre, 2019; Widjaja et al., 2017). In addition, 25-50% of deaths in pregnant women were due to cardiovascular complications, one of which was arrhythmia (Purwoko, 2021).

Increased risk factors for arrhythmia are often caused by the presence of diseases suffered, such as acute respiratory distress syndrome and other diseases. Apart from disease factors, patient conditions can also be one aspect that increases risk factors for arrhythmias such as pregnancy (Miyazawa, 2019; Patel et al., 2022) Pregnancy is

a process of fertilization to implantation of spermatozoa and ovum, lasting 40 weeks (Indradewi et al., 2022). Pregnancy is a condition that can increase the metabolic needs of the mother and fetus so that it can cause physiological changes, namely cardiovascular, autonomic, and hormonal changes in the mother (Miyazawa, 2019; K. Tamirisa et al., 2022). These changes can cause the risk of arrhythmia in pregnant women to increase (K. Tamirisa et al., 2022).

Based on contemporary research on 2.2 million hospitalized patients with pregnancy in New York over 15 years, it was found that heart attacks and arrhythmias were more common in pregnant women with heart disease (0.3% and 7.2%) compared to pregnant women without heart disease (0.004% and 0.3%) (Owens et al., 2018). Based on this background and the lack of reports related to the prevalence of arrhythmia in pregnant women in general in Indonesia, especially in West Nusa Tenggara, the researcher wants to know about the prevalence and the characteristics of arrhythmia in pregnant women at the Regional General Hospital of West Nusa Tenggara Province in Indonesia from January 2023 to December 2023.

2. METHODS

The study was descriptive with retrospective data. The research sample will be taken through medical records using the total sampling method with the population data of all pregnant women at the Regional General Hospital of West Nusa Tenggara Province in Indonesia from January 2023 to December 2023. The total population of the data will be included. The data collected from the study results will be analyzed descriptively in tables (Veronika & Ayu, 2019).

$$Prevalence = \frac{Total\ of\ cases\ with\ arrhythmia\ in\ pregnancy}{total\ pregnant\ women} \text{ X } 100\%$$

Figure 1. Prevalence Formula

3. RESULT and DISCUSSION

Data Characteristics

AGE	Gestational Age	EKG	Comorbidity	Baby Outcome
18 Years Old	5 Month	PAC (*Premature Atrial Contraction*)	Chronic Hypertension	Unborn In NTB Provincial Hospital
37 Years Old	8 Month	AV Block (*Atrioventricular Block*)	-	Life
39 Years Old	4 Month	Atrial Flutter	CHF *(Congestive Heart Failure)*	Life
35 Years Old	2 Month	Atrial Fibrilasi	CHF *(Congestive Heart Failure)*	Life
28 Years Old	3 Month	SVT (*Supraventricular Tachycardia*)	Sepsis	Life

24 Years Old	6 Month	SVT (*Supraventricular Tachycardia*)	CHF *(Congestive Heart Failure)*	Death
27 Years Old	3 Month	AV Block (*Atrioventricular Block*)	Congenital Heart Disease	Life
28 Years Old	6 Month	SVT (*Supraventricular Tachycardia*)	PPCM *(Peripartum Cardiomyopathy)*	Death

Prevalence of Arrhythmia

Eight out of 648 (0.012 %) pregnant women at the Regional General Hospital of West Nusa Tenggara Province in Indonesia had arrhythmia from January 2023 to December 2023 (**Table 1**).

Table 1. Prevalence of Arrhythmia in pregnancy in 2023

Time	**Number of Patients (n)**
January	1
February	0
March	2
April	0
May	2
June	0
July	2
August	0
September	0
October	1
November	0
December	0
Total Patients	**8**
Total Pregnant Women	**648**
Percentage	**0,012%**

Based on this study, 8 out of 648 pregnant women experienced arrhythmia at the NTB Provincial Hospital from January 2023 to December 2023. This is different from a study in the United States from 2000 to 2012, which found that 68 of 100,000 pregnant women experienced arrhythmia (Eckardt, 2021).

Table 2. Prevalence of arrhythmias in pregnancy based on the types of tachyarrhythmias and bradyarrhythmias

BRADIARITMIA		
Types of Arrhythmia	**Number (n)**	**Percentage**
AV Block	2	0,003 %
TAKIARITMIA		
Types of Arrhythmia	**Number (n)**	**Percentage**

Supraventricular Tachycardia (SVT)	3	0,004 %
Premature Atrial Contraction (PAC)	1	0,001 %
Atrial Flutter	1	0,001 %
Atrial Fibrilasi	1	0,001 %

SVT occurred in 4 pregnant women (0.004%), and AV Block occurred in 2 pregnant women with a percentage of cases (0.003%). In this study, SVT is one of the most frequent arrhythmias that often occur in pregnant women. This study is almost identical to K. P. Tamirisa et al., 2022 which states that SVT is one of the arrhythmias with the most cases in pregnant women. (K. P. Tamirisa et al., 2022)

Seven of 648 pregnant (0.01%) women with other diseases accompanied the occurrence of arrhythmias. The most common was CHF 0.004%, followed by Peripartum Cardiomyopathy (PPCM) (0.001%), congenital heart disease (0.001%), chronic hypertension (0.001%), and sepsis (0.001%). One in 8 patients has no comorbidities. This study was in line with the research found by Owens et al., 2018 which stated that arrhythmias with other heart diseases occurred more than those without other heart diseases (7.2% vs 0.3%) (Owens et al., 2018).

Table 3. Prevalence of arrhythmia in pregnancy based on comorbidities

Comorbidity Type	**Number (n)**	**Percentage**
PPCM *(Peripartum Cardiomyopathy)*	1	0,001 %
Congenital Heart Disease	1	0,001 %
CHF *(Congestive Heart Failure)*	3	0,004 %
Chronic Hypertension	1	0,001 %
Sepsis	1	0,001 %
Total	**7**	**0,01%**

In this study, there was only one patient with PPCM with diagnosed SVT, with the outcome of the baby was life. PPCM can cause arrhythmias due to the formation of arrhythmogenic substrates due to fibrofatty turnover in the myocardium (Wichter et al., 2021).

AV block in this study only occurred in 1 patient with tetralogy of Fallot (TOF), in which the outcome of the baby died. CHD can cause an increase in heart pressure and volume due to a change in the structure of the myocardium, which can increase a person experiencing arrhythmia (Fürniss & Stiller, 2021).

In this study, three patients with CHF (0.004%) had different types of arrhythmias, Atrial Flutter, Atrial Fibrillation, and SVT, with the outcome of the baby's life. Arrhythmias can occur in a CHF patient due to disruption of a heart structure and worsening of heart failure (Ayu Agung Laksmi et al., 2018).

PAC occurred in 1 patient (0.001%) with comorbid chronic hypertension in this study. Hypertension can cause arrhythmia when increased blood pressure occurs continuously for an extended period (Gawałko & Linz, 2023).

Severe sepsis affects autonomic imbalance and a high increase in inflammatory factors, which can induce arrhythmias (Shahreyar et al., 2018).

In this study, there was a woman in pregnancy with AV block without comorbid factors. This occurs due to the influence of pregnancy on changes in heart physiology to adapt to the needs of pregnant women. (Fürniss & Stiller, 2021).

4. CONCLUSION

This study showed that 8 out of 648 pregnant women (0.012%) had arrhythmias. Early recognition of arrhythmia is significant to prevent morbidity and mortality in patients with pregnancy and also to improve good clinical outcome of the baby.

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