

CASE REPORT

Anesthesia Management in Pregnancy with Heart Disorder using Walking Epidural Analgesia (WELA)

Yoram Yudhatama^{✉*}

Article info :

Submitted :

03-03-2022

Accepted :

02-06-2022

Published :

30-10-2022

<https://doi.org/10.20961/soja.V2i2.59805>

Authors' affiliations :

*Anesthesia and Intensive Therapy Department, Universitas Lambung Mangkurat, Banjarmasin, Indonesia

Correspondence:

[✉]yudatama2001@gmail.com

ABSTRACT

Background: Heart disease in pregnancy is one of the leading causes of morbidity and mortality in pregnancy and childbirth. The intrapartum and postpartum periods are critical periods in which most of the deaths occur in this period. Manifestations appear in the form of heart failure which increases maternal and fetal morbidity and mortality.

Case Illustration: We will report a case report of a 23-year-old woman with a diagnosis of G2P0A1 H 40 weeks, a single live intrauterine fetus with congestive heart failure due to rheumatic heart disease with mitral stenosis.

Conclusion: The patient successfully underwent spontaneous labor under anesthesia facilitated by the walking epidural analgesia (WELA) technique with levobupivacaine and fentanyl agents which were administered continuously using a syringe pump during the labor process.

Keywords: labor; walking epidural analgesia; WELA; levobupivacaine; pregnancy

INTRODUCTION

Heart disease in pregnancy is one of the leading causes of morbidity and mortality in pregnancy and childbirth. The prevalence of heart disease in pregnancy was the most common cause of maternal mortality at 200 cases as of 27 March 2020 (4.74%) . The intrapartum and postpartum periods are critical periods in which most of the deaths occur in this period. Manifestations appear in the form of heart failure which increases maternal and fetal morbidity and mortality. Death of pregnant women due to heart disease can be caused directly (obstetric complications) and indirectly (severe disease due to pregnancy)¹.

The challenge for anesthesiologists in dealing with labor with cardiac disorders is to reduce the pain caused during delivery which results in impaired heart function. The advantage of using walking epidural analgesia (WELA) is that it can accelerate the effectiveness of contractions and reduce the length of labor. Pregnant women can feel the sensation of labor like labor in general but with mild pain intensity².

CASE ILLUSTRATION

A 23-year-old 56 kg woman with a BMI of 23.3 came with a diagnosis of G2P0A1 H 40 weeks + JTHIU + CHF

e.c. Mitral Stenosis Rheumatic Heart Disease came with complaints of blood mucus discharge since 8 hours ago, discharge of water (-), previous history of CHF with not taking the medication regularly. The patient said he felt tired easily, heart palpitations, shortness of breath was felt for about 1.5 months. The patient said this symptom was not felt before. Fetal heart rate and fetal weight were normal. Vital signs are good with laboratory results within normal limits. A murmur was heard along the left sternal line.



Figure 1 Maternity USG

From the ultrasound results, it was found that the fetus, single, alive, intrauterine, head presentation, according to gestational age 37-38 weeks, the placenta is located at the Gr I fundus with sufficient amniotic fluid. The patient underwent an epidural insertion for painless labor management during the 1st stage of the latent phase because from the womb it would

accelerate the 2nd stage using vacuum extraction which caused painful stimulation. He was given levobupivacaine 0.125% + fentanyl 20 g as much as 12cc for initial administration. For maintenance was given continuously levobupivacaine 0.125% 1cc/hour using a syringe pump. Eight hours later the baby boy was born using vacuum extraction with AS 7-8-9. The mother's hemodynamics at the time of delivery and the duration of labor was stable and an evaluation of pain during delivery was obtained VAS 3/10.

DISCUSSION

Pregnancy with cardiac disorders requires multidisciplinary coordination of obstetricians, anesthesiologists, cardiologists. In Indonesia, the maternal mortality rate due to heart disease in pregnancy ranges from 1-2%. Rheumatic heart disease is the most common type of heart disease, and more than 90% usually occurs with mitral valve abnormalities (mitral valve stenosis), followed by congenital heart disease and heart muscle disease.³ Research conducted by Bambang DW, Suhatno Djoko Sumantri on 4741 cases of childbirth at RSU Dr. Soetomo Surabaya for four years (1990-1993), found that pregnant women with heart disease (excluding hypertension in

pregnancy) were 31 cases per year or 0.65% per year with a mortality rate of 4.88%. Compared with 0.3% per year from 1972-1973 and 0.5% per year (1978-1982), the incidence of pregnant women with heart disease shows an increase from year to year³.

In general, vaginal delivery is usually an option if there is no obstetric indication for cesarean section. Vaginal delivery has many advantages, such as less blood loss, reduced thrombotic risk, and lower infection rates. For vaginal delivery, neuraxial anesthesia is the preferred method of analgesia/anesthesia. This is associated with a lower risk of death, cardiac arrest, and anesthetic complications. However, general anesthesia may be a better choice in certain patients who may not be able to tolerate or may not be amenable to neuraxial anesthesia⁴. In mitral stenosis there is resistance in the left ventricle which causes pressure in the left atrium and pulmonary veins to increase. This can lead to pulmonary congestion and edema. In addition, mitral stenosis may be accompanied by atrial arrhythmias during pregnancy and during delivery. Because during pregnancy there is an increase in cardiac volume and output, shortness of breath and decreased ability

to exercise can occur. When the heart rate increases, the diastolic filling decreases and the atrial pressure increases, which can lead to pulmonary congestion and edema. Another maternal risk for women with mitral stenosis is thromboembolism^{4,5}.

Physiological changes in pregnancy include an increase in blood volume reaching 30 to 50%, which is followed by an increase in cardiac output (cardiac output). It appears in the first trimester and peaks at 20-24 weeks of gestation. After that it will persist and begin to decline 3 days after delivery. Murmurs can be heard which are normal in pregnancy. Usually weak, middiastolic and heard along the left sternal border. The intensity increases with increasing cardiac output, but if the sound is very loud and in the form of a diastolic murmur, continuous murmur or a strong systolic murmur, an echocardiographic examination is necessary. This patient belongs to class II according to the New York Heart Association classification⁶.

Based on the literature Chestnut's Obstetrics pain in the 1st stage of labor occurs due to distension of the lower uterine segment and cervix. Fetal descent causes stretching of the vagina and

perineum causing pain in the S2-S4 innervation. WELA is performed when labor has occurred, which is characterized by uterine contractions and pain, usually after 2 cm of cervical dilatation. The desired block is as high as T10-S4 which supplies the uterus and birth canal during labor. Epidural analgesia techniques can be performed in a sitting position or a lateral decubitus position, using an epidural needle, we can perform a puncture at the L2 interspace. 3 or L3-4.3 Epidural was chosen because it can reduce maternal catecholamine concentrations and can improve uteroplacental perfusion and improve uterine contractions. Levobupivacaine was chosen because it has a relatively rapid onset and long duration. He was given levobupivacaine 0.125% (sensory block) as much as 12cc for initial administration. Then for maintenance was given continuously levobupivacaine 0.125% 1cc/hour using a syr pump. The addition of fentanyl 20 g strengthens levobupivacaine analgesia without causing pruritus, nausea, and neonatal depression^{5,7}.

In addition to WELA, it can also be done with the ILA (Intrathecal Labor Analgesia) technique. ILA can be performed when the opening is above

4cm. Compared to the epidural technique, ILA has almost no side effects. The dose given is much less so that it does not interfere with the condition of the mother and baby during the delivery process. Mothers can still push because ILA does not affect the ability to push at all. Side effects that may be experienced are the possibility of slow uterine contractions, a decrease in blood pressure, itching or headaches, although these are rare. WELA and ILA have a significant impact on all hormones in labor, resulting in inhibition of β -endorphin production, reduced oxytocin production during labor, inhibition of catecholamine production, thereby slowing or stopping labor in the early stages. The advantages of using WELA compared to ILA are that the patient's hemodynamics is more stable, the height of the block can be maintained by adding anesthetic drugs if it regresses via a catheter, it is more comfortable for the mother and the effect on the baby is minimal⁸.

CONCLUSION

The patient successfully underwent spontaneous labor under anesthesia facilitated by the walking epidural analgesia (WELA) technique with levobupivacaine and fentanyl

agents which were administered continuously using a syringe pump during the labor process.

REFERENCE

1. Elfil AMH YK. Epidemiology of Cardiac Disease during Pregnancy in Khartoum Hospital, Sudan. *J Womens Heal Care*. 2015;04(02):4–7.
2. Marwoto M. Anestesi Epidural Lumbar Untuk Memfasilitasi Persalinan Bebas Nyeri. 2007;
3. Muninggar L, Yusuf M, Prasetyo B. Maternal mortality risk factor in pregnancy with heart disease at Dr. Soetomo General Hospital, Surabaya, Indonesia. *Maj Obstet Ginekol*. 2019;27(1):17.
4. Luthra A, Bajaj R, Jafra A, Jangra K, Arya VK. Anesthesia in pregnancy with heart disease. *Saudi J Anaesth*. 2017;11(4):454–71.
5. Hill NE, Granlund B. Anesthesia For Labor, Delivery, And Cesarean Section In High-Risk Heart Disease. In *Treasure Island (FL)*; 2022.
6. Sanghavi M, Rutherford JD. Cardiovascular physiology of

- pregnancy. Circulation.
2014;130(12):1003–8.
7. Chestnut DH, Wong CA, Tsen LC, Kee WDN, Beilin Y, Mhyre J. Chestnut's obstetric anesthesia: principles and practice e-book. Elsevier Health Sciences; 2014.
 8. Rahmati J, Shahriari M, Shahriari A, Nataj M, Shabani Z, Moodi V. Effectiveness of Spinal Analgesia for Labor Pain Compared with Epidural Analgesia. *Anesthesiol pain Med.* 2021 Apr;11(2):e113350.