Predictive Analysis of Postpartum Haemorrhage And
Hypothermia Using Wearable Device

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Abstract. Postpartum Haemorrhage is the loss of blood in excess of 500 ml during vaginal or caesarean deliveries. Based on the amount of blood flow, PPH is classified into two types primary and secondary PPH. primary PPH will occur within 24 hours of delivery which may lead to immediate death and secondary PPH will occur after delivery or up to 6 weeks of delivery. It is more difficult to find a PPH in earlier stage, so pregnant women are exposed to excess blood loss which causes them to suffer and die.This project mainly focuses on the symptoms and detection of postpartum haemorrhage and hypothermia. It provides a life-saving product model which is affordable, easy to wear and highly comfortable. It also elaborates the health issues faced by women during and after child-birth.Initially, a low- cost prototype model is built which has sensors to measure and record temperature, blood pressure, pulse rate, sweat and fast heart beat.Based on the mere success rate, it is then built as a product-based model which provides more accurate and highly efficient result that helps for maternal issues and decrease in the morbidity rate.

1. Introduction

Postpartum haemorrhage is one of the major causes of death during child birth. In the developing world, several countries have maternal morbidity and mortality rates in excess of 1000 women per 100,000 live. The statistical facts revealed by World Health Organization claims that about 14 million women suffer from PPH all around the world. All pregnancies are at risk of pph even if no predisposing factors are present.

After delivery, pregnant women may attain the effects of postpartum haemorrhage.Postpartum Haemorrhage refers to the amount of blood from the genital tract following birth of the baby up to end of the puerperium which adversely affects the general condition of mother, evidenced by increasing blood pressure and heart rate. Haemorrhage may occur before, during or after delivery of placenta. Based on the amount of blood flow pph will be classified in to two types primary and secondary pph. The primary pph will occur within 24 hrs of delivery. The secondary postpartum haemorrhage is retained bits of cotyledon or membranes and endometritis. The complication of postpartum haemorrhage are massive blood loss, dizziness, fatigue, decreased blood pressure, increased heart rate, and increased temperature, sweat rate, swelling and pain in tissues in the vaginal and perennial area.

2. Literature Survey

Stepan Feduniw[1] et al. has addressed the risk factor based on uterine atony and also mentioned the effective treatment for postpartum hemorrhage. Appropriate diagnosis of EPH is the most important issue. The treatment should be causative. AbirSaha[2] et al. had discussed the possible SNS(Social Networking sites)

based interventions and design implications that can effectively and feasibly reduce PPD(Postpartum Depression) in women in developing countries.Fan Qi[3] et al. in the year 2018 has proposed KNN(K-Nearest Neighbor) algorithm,which is used for predicting the postpartum hemorrhage. It can contribute to the prevention and control of postpartum hemorrhage.RaditePurwahana [4] has revealed the purpose of multinomial logistic regression, which is used to analyze the data of mothers dying in the postpartum period based on the main variables causing maternal death. Daniel Surbek[5] have analyzed, and conclusions were made by the Swiss PBM in obstetrics working group of experts in a consensus meeting. Patient blood management [PBM] has been acknowledged and successfully introduced in a wide range of medical specialities.Oluwakemi Adegoke[6] was developed the Every Second Matters for Mothers and Babies-Uterine Balloon Tamponade (ESM-UBT) device which is used to control the blood to uterus. Marieke C. Postpartum hemorrhage (PPH) is the leading cause of maternal death in Tanzania.Punt [7] has revealed obstetric bleeding problems often occur in women with IPRD(inherited platelet receptor defects).In order to improve the clinical management of women-specific bleeding in IPRD, international cooperation is required, preferably on prospective studies..Mahmoud Alalfy [8] had mentioned the usage of intrauterine misoprostol which is the prevention of primary PPH. Postpartum hemorrhage is the leading cause of maternal mortality worldwide. To compare the incidence of postpartum hemorrhage in women eligible for elective cesarean section (CS) delivery when using intrauterine misoprostol added to oxytocin versus oxytocin alone.

3. System Architecture

The below Fig. depicts the identification of hypothermia. Using wearable devices, the temperature of pregnant ladies should be collected .After delivery ,doctor need to be monitor the level of temperature .If it is reduced to 37^0 c, then the pregnant women should be affected by hypothermia .So that the parameters should intimate to the doctor about the critical level of patients thereby protecting the pregnant women from maternal death. If the temperature level is normal, provide a medical guidance to them.
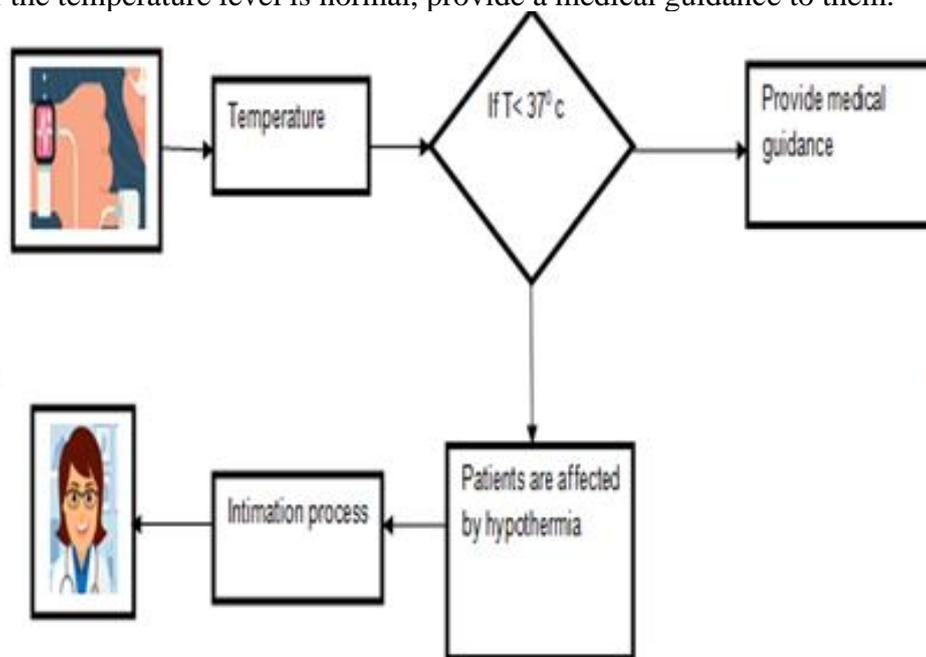
Figure 1. Identifying hypothermia patients

4. Data Flow Diagrams

4.1 LEVEL 0

By using wearable device, the parameters of patients will be collected. Analyze the collected data and finding postpartum Haemorrhage and hypothermia affected patients.

Figure 2. Level 0 DFD Diagram

4.2 Level 1

The changes in the body are checked with the default value that is already collected from the patients using the device. From the changes, it concludes whether the patient has attained critical level or not. Using the intimation process the details will be provided to the doctor about their biological conditions
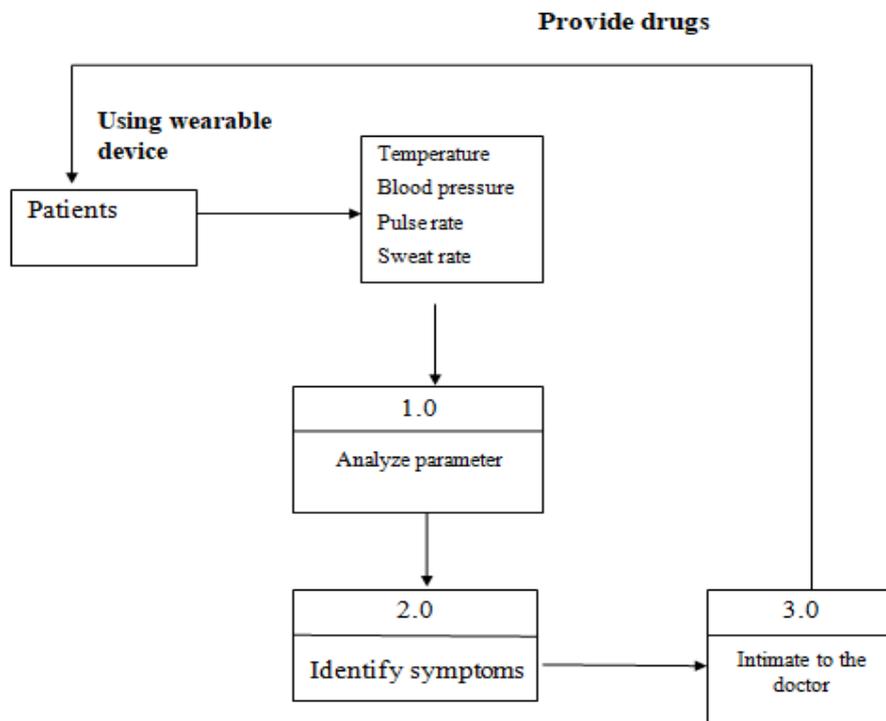
Figure 3. Level 1 DFD Diagram

5. Conclusion

In this paper, we have collected several parameters of patients which will be used to prevent the postpartum hemorrhage (PPH) and hypothermia affected patients. The predicted values level goes abnormal in sensor; it intimates to the doctor through IoT. Finally, pregnant women will be easily prevented from postpartum hemorrhage and hypothermia after maternity

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