

Developing Medical Devices for e-Health to Work towards The Overseas

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I. Abstract

The global maternal mortality rate remains high and many of these deaths were preventable and occurred in developing countries. The perinatal mortality rate in developing countries is significantly higher than the global average of 17.7 deaths per 1,000 live births. The Global Burden of Stillbirths, released by UNICEF and others in October 2020 (1), two million babies a year are stillborn because of poor perinatal management.

We propose our solutions to solve these problems. For the effective use of medical resources, we have developed Melody i, a communication platform for pregnant women and doctors. Melody i has the IoT devices called Fetal Monitor iCTG, Which has a fetal heart rate meter and a uterine contraction meter. (Fig 1) If the mother and her baby have any concerns, they can immediately see a remote doctor via the internet. In an emergency, she can be referred to a large hospital very smoothly. It can prevent baby's problems such as hypoxia, stillbirth and so on.

The core technology of the Fetal Monitor-iCTG is a medical device with IoT communication technology, lightweight, wireless, and easy to carry. It offers the same high-level performance as a conventional CTG.

II. Results & Discussion

With the solution Melody i, the doctor diagnoses from the CTG graph as before. What is different is that the diagnosis can be made remotely. In Japan, we use it for the management of high risk pregnant women and to avoid the risk of infection under infections like COVID-19. (2) At this time, it is also advantageous that the iCTG can be washed with water or wiped with alcohol.

In Thailand and Bhutan, we mainly use it for referrals. By placing iCTG throughout the community, if there is a risk to the pregnant woman or the fetus, we send the pregnant woman to a secondary or tertiary hospital as soon as possible.

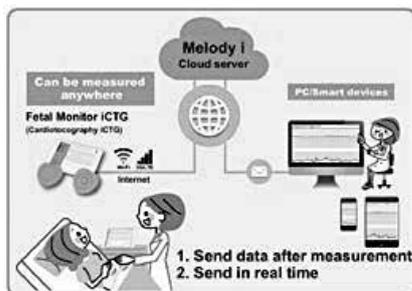


Fig 1. The solution Melody i and fetal monitor iCTG in use

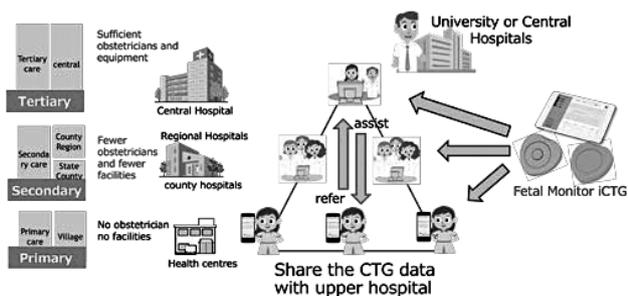


Fig 2. A system of wide-area perinatal referral solutions to look after pregnant women and their unborn babies in developing countries and elsewhere.

III. Conclusion

In conclusion, we will show you three type of perinatal eHealth made possible by fetal monitor iCTG. First, pregnant women living in island and mountainous areas, can be referred to the central hospital as soon as possible. Second, for high-risk pregnancies and infection risks, online medicine will be available. Finally, fetal monitoring data in shelters and emergency vehicles can be sent to doctors real-time.

As in these two cases, you do not have to be in a hospital to use the Fetal Monitor iCTG. That device can be delivered to the pregnant woman home and her CTG data can be sent to a doctor at the hospital.

IV. References

- (1) UNICEF, "A Neglected Tragedy: The Global Burden of Stillbirths" <https://data.unicef.org/resources/a-neglected-tragedy-stillbirthestimates-report/>
- (2) Feasibility and safety of urgently initiated maternal telemedicine in response to the spread of COVID-19: A 1 - month report <https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/jog.14378>