Tracking and Development of Fetal using 4D Sonography

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Abstract

The main objective behind this paper is to fulfil the desire expectation of parent about their child; so main purpose is to tracking of the fetal in mother's abdomen. This can be done by using several Sonography techniques. We will use leading edge 4D Sonography for this project. By using this system, we can observe the sudden changes in fetal. We will also examine methodically different parameters such as blood pressure, temperature of fetal as well as mother too. This process will do on second and third trimester period of pregnancy.

Keywords - *Fetal, 4D Sonography, Sound, Database*

I. INTRODUCTION

Whenever people are planning their family they are having some desire expectation related to their child. Every parent wants some characteristics in their child such as he or she would be stronger, healthy, happy, smart, bright, intelligent, courageous Genius etc. They also want some optimistic characteristic of their heredity occupation. These are not fairytales or merely stories neither are mythological stories; these are all scientifically planned procedure. Earlier days this procedure was done by the Ayurveda. It is all about concept of genes, genetics and genetic engineering. It has been already proved that external atmospheric changes surrounding maternal will defiantly effect on fetal. Those changes can be examine or determine by using different Techniques.

Our purpose is to make mother listen different tracks and examine the different changes in fetal using leading edge 4D Sonography. We can observe these changes by different facial changes of fetal or different parameter of maternal such as temperature, Blood pressure etc.

After collecting the data, these data needs to be stored so for that we are using a database system. The database system will be helpful for future aspects Also, useful for administration of hospital.

The database system consist patient details including trimester, parameters, sound details which was given to patient and observation before and after practical.

A. Expectation of Mother

Becoming a parent is a major developmental transition of adulthood. Individuals often have optimistic expectations about parenthood, yet this transition also presents a number of challenges. There are so many expectations a mother have before, while and after pregnancy. Mother wants their heredity occupation or other characteristics in child. Sometimes it is difficult to get desire characteristics in child after birth so during pregnancy it is suitable to start or developing a desire quality in child. In some cases child are having undeveloped CNS (Central Nervous System), this deficiency is difficult to normalize after birth. Music stimulus will be helpful to detect the CNS of fetal. We can observe the response before and after practical.

B. 4D Sonography

The 4D Ultrasound is like a 3D Ultrasound but it will give us a real-time three dimensional moving image. We are using Samsung Madison ACCUVIX [XG] for Ultrasound test.

Figure 1: 4D Ultrasound Machine

Some Specification of Machine:
Imaging Modes: 2D Mode, M- Mode, Colour Doppler, Continues Wave Doppler, Tissue Doppler Imaging, Power Doppler, Colour M Mode
Gray Scale: 256 (8 Bits)
Output Connection: Serial Connection, Microphone, LAN, USB
Probes: type BF
Type BF is less stringent than CF, and is usually for devices that have semi conductive contact with the patient, or having medium or long run contact with

the patient. Screen will show us Different parameters such as trimester, Heart rate, Frequency Etc.

C. Database

A database is an organized collection of data, generally stored and accessed electronically from a computer system. Where databases are more complex they are often developed using formal design and modelling techniques.

II. HISTORY

It is believed that the evolution of the universe is from the sound of '*Damru'* of Lord Shiva. According to the Samkhya philosophy, 24 elements are involved in the evolution of the universe arising from the union of Prakriti & Purusha, up to the manifestation of the Mahabhutas and the grosser objects thereafter. Panchamahabhutas are the first gross substances in the sequence of evolution. Ayurveda also believes that the generation of a body follows the same pattern. Shabda, Sparsha, Rupa, Rasa and Gandha are the Tanmatras (subjects) of Akasha, Vayu, Agni, Jala & Prithvi Mahabhutas respectively and chronologically reside in Karna, Tvak, Chakshu, Jihva & Ghrana Jnanendriyas and Jihva, Hasta, Pada, Upastha and Payu Karmendriyas. Similar to the development of the other aspects, the development of Indriyas in intra uterine life is nourished as the mother follows 'GARBHINI PARICHARYA' (specific dietetic and lifestyle regimen of the Natal period).

III. METHODOLOGY

A. Collection of data

1. Trimester

Trimester is the period of time where fetal will develop in different stages. There are three trimester in Pregnancy, Each trimester has specific fetal development process. Normal Pregnancy is of 40 weeks. Each Trimester is having duration of 3 Months. First Trimester is of 0-12 Weeks, Second Trimester is of 13-27 Weeks and Third Trimester is of 28-40 Weeks. Fetal can hear internal sound at the age of 18 week and External sound can be heard at the age of 24 week. Second half Trimester is convenient to perform this practical.

2. Normal Observation

We have observed normal heart rate of Fetal before the practical. For this we had taken 8 pregnant women. There are 5 women is in the duration of second trimester and 3 women are in the Duration of third trimester. Normal Heart rate of fetal is between 120 to 140 in second trimesters and 120 to 160 in third trimesters.

3. Sound

Here we are taking two different types of sounds one is rock music and another is Calm (Shanta Raag). We will make mother to listen this different sound tracks and observe the difference before listening music and after listening music. We will take observation of second and third Trimester.

Table 1: Changes of Heart Rate in 2nd and 3rd Trimester

Observation				
Subject	**Trimester**	**HR Before**	**HR After**	**Track**
Patient 1	Second	150	146	Calm (Shant Raag)
Patient 2	Second	132	157	Rock Music
Patient 3	Second	130	159	Rock Music
Patient 4	Second	140	150	Rock Music
Patient 5	Second	150	140	Calm (Shant Raag)
Patient 6	Third	154	164	Rock Music
Patient 7	Third	137	180	Rock Music
Patient 8	Third	137	148	Rock Music

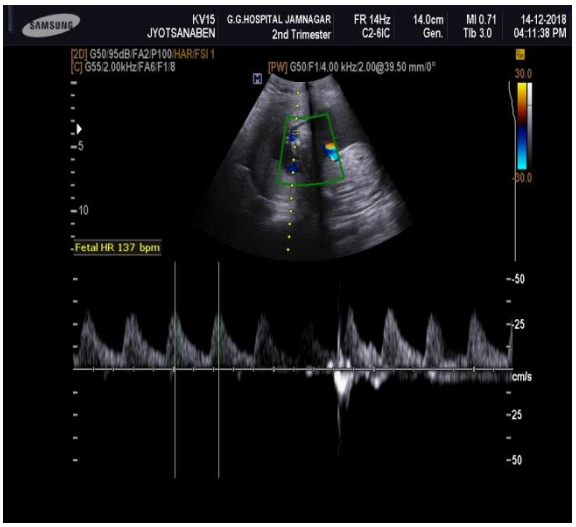

Figure 1: Real time observation before practical (Patient 3-Second Trimester)

Figure 1shows the Heart rate and Trimester of patient 3. Before practical the heart rate was 130 bpm. Figure 2 shows the Heart rate and Trimester after practical. The heart rate after listening music was 159 bpm. The patient is from Second Trimester.

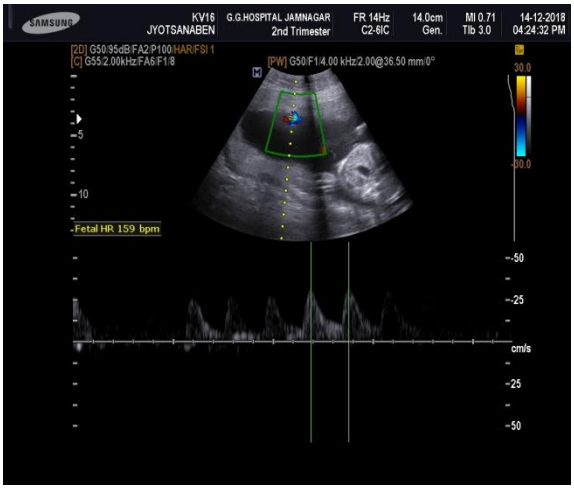

Figure 2: Real Time observation after practical (Patient 3- Second Trimester)

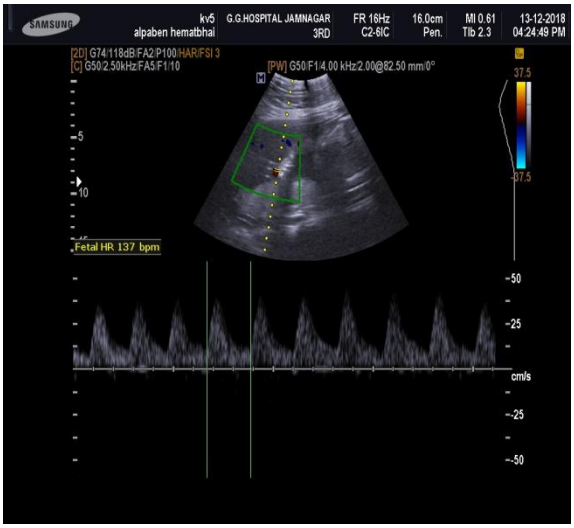

Figure 3: Real Time Observation Before practical (Patient 7- Third Trimester)

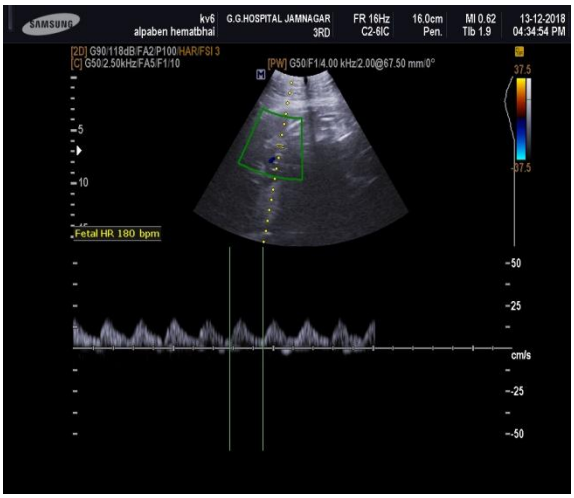

Figure 4: Real Time observation after Practical (Patient 7- Third Trimester)

B. Database

Sometimes it is difficult to store huge number of patient's data manually. Electronically stored data will be easy to store and also it will be a helpful for further enquires. Database is a one type of medium to store the data electronically.

Here we are creating one database system. Here we used Object Oriented Software Development Strategy. By integrating object–oriented requirements analysis with OO design, the Object–Oriented Software Development Method (OOSD) allows a practical focus on the objects of a problem

Throughout. Object oriented systems development is an extension of structured programming: Object Oriented development emphasizes the benefits of modular and reusable computer code and modelling real-world objects, just as structured programming

emphasizes the benefits of properly nested structures. From Various Software Development Strategy approaches, we used Incremental Approach. In this, various methods are acceptable for combining linear and iterative systems development methodology approaches, with the primary objective of each being to reduce inherent project risk by breaking a project into smaller segments and providing more ease-of-change during the development process.

We have tried to make it very user friendly and easy to understand so you do not get bored. Need not to say that, Computers are very fast and accurate so obviously errors will be less.

1. It will be very speedy.
2. One does not find it cumbersome since he just needs to enter data as instructed.
3. The major problem of database sorting, manipulating and maintenance is handled very

nicely.

•Secured Usage: System can be used by only those who are assigned a login and password and authenticate by admin of this site. No other user can access the system.

•Faster information access: No information will be deleted of from the database.. All the investment information is stored in the system itself available at any time.

•Faster Communication: The real-time upload of documents, information and monitored workflow speeds up communications.

•Clear Visibility: Finance has a "clear line of sight" making it easier to detect bottlenecks & amp; identify inefficiencies.

•Better Decision Making Ability: With more information readily available, user can make better decisions on selecting proper plans.

•Maintaining Information: All the required information of user is stored in database which would be available at any time.

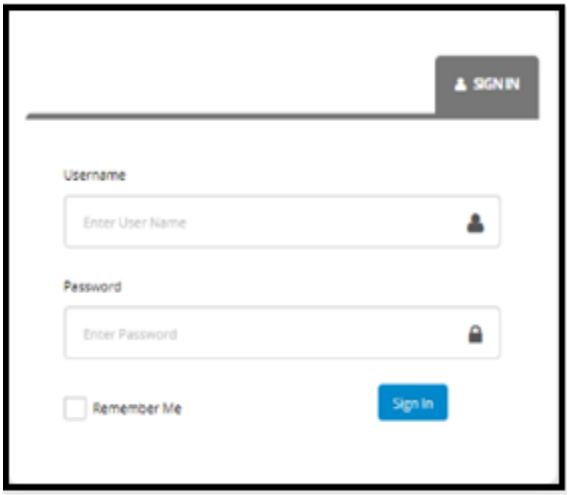

Figure 5: Login page

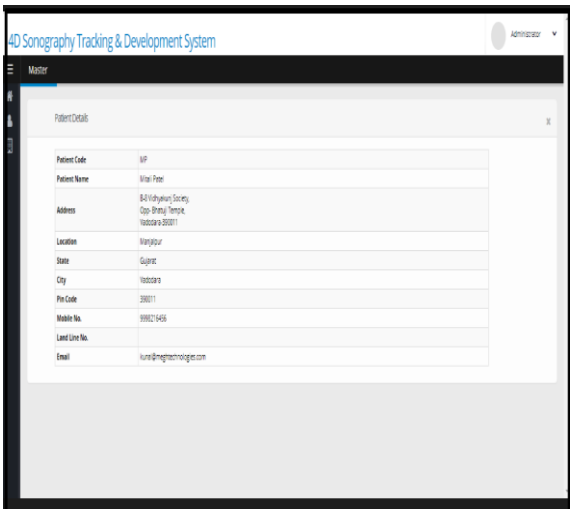

Figure 6: Patient Details

IV. CONCLUSION

Central Nervous system of Fetal is developed of all patients. Fetal can recognize the sound and according to sound their heart rate is changed so we can say that this method can be used to detect the Central Nervous System of fetal. Different tracks of sound make changes in fetal heart rate. If there is Calm music then fetal's heart rate get slower and if there is a rock music the fetal's heart rate gets faster. There is large number of patients in Hospital so database system will be helpful to the administration of hospital. They can easily store the data with safety.

ACKNOWLEDGMENT

This work is supported by Parul University, Vadodara, Gujarat. We would like to express our sincere thanks to all people who supported us.
We would like to Sincere thanks to Dr. Shilpa Chudasma, Dr. Karishma G. G. Hospital, Jamnagar who supported our project work and data collection.

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