Quad screen test, an assay for prenatal screening to assess birth defects: Experience using the Beckman Access2 Immunoassay Analyzer and Benetech PRA

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Abstract

The Quadruple test is used to calculating the risk of serious birth defects that is performed between weeks 15 and 18 of pregnancy, during the second trimester. However, the procedure can be done up to week 22. It measures high and low levels of AFP, abnormal levels of HCG and estriol, and high levels of Inhibin-A.

To accurately calculate the risks of birth defects using the quad screen, each laboratory must first establish the normal reference ranges of maternal serum AFP, uE3, β-hCG, and DIA levels using its patient population to account for regional and demographic variation. However, to be able to interpret these results, each laboratory must establish its normal reference with a specific value of multiples of the median (MoM).

The maternal serum was collected between 15 and 20 weeks of gestation after the informed consent and all the requisition form were documented that include all the patient demographics information, clinical data, and medication history. Consequently, the biological values of four maternal serum markers from the sample were measured through the Beckman Access2 instrument that utilizes chemiluminescent noncompetitive two-site immunoassays. Calibration of the instrument and verification of the controls within the acceptable limits were established for quality assurance. Accordingly, the Benetech PRA software package was used to convert maternal serum analyte concentrations to multiples of the median (MoM) and calculates the risks of particular birth defects.

Photograph



Results:

The risk factor as per the value of quad serum markers and details about the patient information was displayed that calculated the risk of Down Syndrome (Trisomy 21), Edward's Syndrome (Trisomy 18) and Open Neural Tube Defects. Subsequently, effective genetic counseling was provided as per the report to the respective patients for the improvement of the personalized primary care they deserve.

Recent Publications

- Tecleab, A., Lyashchenko, A. K., & Rai, A. J. (n.d.). Quad Screen Test , A Multiplexed Biomarker Assay, *1885*, 297–307. https://doi.org/10.1007/978-1-4939-8889-1
- Benn PA (2002) Advances in prenatal screening for Down syndrome: I. general principles and second trimester testing. Clin Chim Acta 323(1–2):1–16
- Benn PA et al (2003) Incorporation of inhibin-A in second-trimester screening for Down syndrome. Obstet Gynecol 101(3):451–454
- Wald NJ, Huttly WJ, Hackshaw AK (2003) Antenatal screening for Down's syndrome with the quadruple test. Lancet 361 (9360):835–836

Biography

Mr. Thapa had received a master's degree in Biochemistry from Bangalore, India (2010). He is a co-founder and researcher officer of Kathmandu Center for Genomics and Research Laboratory (KCGRL,) which is focused on several genetic, infectious diseases and neurological disorders in the Nepalese population. Besides, he is also working as a teaching fellow in several paramedical colleges. Additionally, he is a Joint Secretary of the Neuroscience Society of Nepal (NSN, http://nsnnepal.org/).

In the past few years, Mr. Thapa had published several scientific papers and awarded from different associations and society to present his research works. His objective is to gain more knowledge and understand the intricacies of research, health, and management. He envisions himself as a researcher working further in the relevant research in Nepal where he can execute possible ideas and vision to develop technology and opportunities to combat the tragedies of health, research, and science.

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