Introduction

Chromosomal abnormalities occur much more frequently than is generally appreciated. It is estimated that approximately one of 200 newborn infants has some form of chromosomal abnormality. The figure is much higher in fetuses that do not survive to term. It is estimated that in 50% of first-trimester abortions, the fetus has a chromosomal abnormality. Cytogenetic disorders may result from alterations in the number or structure of chromosomes and may affect autosomes or sex chromosomes **(Cotran et al, 2009).**

Intrauterine detection is of paramount importance for the family and the community. A thickened nuchal translucency (NT) is a powerful marker for chromosomal abnormalities and is also associated with many structural fetal defects. The excellent track record of the first-trimester nuchal evaluation in detecting fetuses with Down syndrome and other defects has cemented this biometric assessment as a standard part of the first trimester sonogram **(Bindra , 2002).**

Actually the enlargement of NT is associated with a variety of structural defects, chromosomal anomalies, genetic syndrome as well as normal outcome **(Cheng et al, 2006).**

Nuchal translucency measurement should follow strict guidelines and holding ongoing audit **(Shaw et al. 2008).** The gestation should be 11–13+6 weeks and the fetal crown–rump length should be 45–84 mm. A mid-sagittal section of the fetus should be obtained and the NT should be measured with the fetus in the neutral position. Only the fetal head and upper thorax should be included in the image. The magnification should be as large as possible and always such that each slight movement of the calipers produces only a 0.1 mm change in the measurement. The maximum thickness of the subcutaneous translucency between the skin and the soft tissue overlying the cervical spine should be measured. Care must be taken to distinguish between fetal skin and amnion. The calipers should be placed on the lines that define the NT thickness – the crossbar of the caliper should be such that it is hardly visible as it merges with the white line of the border and not in the

nuchal fluid. During the scan, more than one measurement must be taken and the maximum one should be recorded **(Snijders and Nicolaides, 2004).**

Three -dimensional sonography has become more popular due to its relative low cost and its high resolution. Some studies have shown a benefit in combining 3D with conventional 2D scanning for the evaluation of normal and abnormal fetal anatomy, with a decrease in acquisition time and improvement in image resolution **(Ship, 2006).**

Three dimension ultrasound potentially allows for more accurate and reproducible volume measurement because the various display modalities allow the observer to correct for any surface irregularities **(Merz, 1999).**

A novel technique measuring nuchal volume (NV) on a 3D machine was introduced. A correlation between NV and other biometric markers in first trimester screening for Down syndrome was introduced **(Shaw, 2008).**

This novel technique is thought to offer less strict guidelines for the assessment of nuchal space, also, less scanning time.