First trimester detection of structural abnormalities using a protocol based approach - 'always detectable 9'
Bangalore fetal medicine centre, Bangalore, Bangalore, India

Objective
We aimed to study the effectiveness of using a protocol driven assessment to detect certain anomalies that are established by the end of the first trimester. The list of 'always detectable 9' was drawn from our previous study on the effectiveness of the first trimester scan.

Methods
Following our previous study which examined the effectiveness in the first trimester scan in detection of fetal structural defects, a protocol for examination of the fetal skull, brain, face, heart, cord insertion, spine and all 4 limbs was developed. 5592 consecutive first trimester scans performed between January 2010 and December 2014 were prospectively studied according to the defined protocol. The protocol included a list of “always detectable 9” which were ‘compulsory checks’ on all fetuses. All scans were performed by FMF certified and accredited operators. 62 fetuses with aneuploidies were excluded.

Results
Of the 5592 fetuses, 62 with aneuploidies were excluded. Of the 5530 pregnancies 110(1.97%) of them had isolated structural defects, of which 87 (79%) were detected in the first trimester. Of the 87 defects, 42 qualified to be in the list of “always detectable 9”. The defects which were detected in the first trimester were acrania 7/7, encephalocele 6/6, holoprosencephaly 5/5, exomphalos 9/10, gastroschisis 1/1, megacystis 11/11, missing limbs 1/1 and bodystalk 1/1. In addition to the 9 always detectable abnormalities in the first trimester, the other abnormalities that were detected were Kyphoscoliosis(6)skeletal dysplasia (3), sacral agenesis (3), Echogenic kidneys (2)polycystic kidneys(2), Ventriculomegaly (2), polydactyly, syndactyly (1), spina bifida (2) and early dandy walker malformation(2) and major cardiac defects (26) were also detected. About 23 fetuses which were reported as ‘normal’ in the first trimester were found to have abnormalities in the 2, 3rd trimester or postnatally. These included cleft lip and palate, talipes, anal atresias and Hypoplastic left heart syndrome. One fetus reported to have a ‘cord cyst’ in the first trimester was found to have exomphalos at the 2nd trimester scan. Our first trimester detection rate for major abnormalities was 79% for all abnormalities and 97.6% for “always detectable 9”.

Conclusion
Our study demonstrates a high rate of detection of fetal abnormalities in the first trimester compared to previous similar studies. This is primarily due to strict protocols enforced in performing the first trimester scan with specific focus on the “always detectable 9”. Our study also demonstrates that it is possible to detect more abnormalities than the 9 at a 11 – 13+6 weeks scan. We propose that in busy units with limited time for detailed scans, one can use the “always detectable 9” protocol to optimise the performance of the first trimester scan.