Introduction

• There is wide variation in the mid luteal serum progesterone levels used as the criterion for ovulation ranging from 3.2 to 38nmol/L (30nmol/L being used in clinical practice).
• Early pregnancy serum progesterone has also been advocated as a tool in the diagnosis of early pregnancy failure with levels above 25nmol/L 'likely to indicate' and above 60nmol/L are 'strongly associated with' pregnancies subsequently shown to be normal.
• It has been suggested that the higher progesterone concentrations are seen in the luteal phase of conception cycles, these cycles were not followed through to early pregnancy.

Aims

• To identify mean ovulatory mid-luteal serum progesterone level suggestive of probable ovulation.
• To investigate if mid-luteal serum progesterone is predictive of pregnancy outcomes.

Methods

• Retrospective observational cohort study of 405 cycles of ovulation induction followed by intrauterine insemination for unexplained sub-fertility or use of donor sperm undertaken in a tertiary level fertility centre.
• Study subjects were in the reproductive age group of 23-40 yrs., non-smokers with BMI of 18-30.
• All cycles were induced for ovulation with clomifene citrate and follicular growth was tracked using ultrasound.
• Ovulation test kits were used to confirm luteinizing hormone surge to time insemination.
• No human chorionic gonadotrophin trigger was used in any of the cycles and luteal phase was not supported with progesterone supplements.
• Serum progesterone level was tested 7 days later. Ultrasound scan at 6-7 weeks confirmed clinical pregnancies.

Results

Mean age group of patients was 32.4yrs (range: 21-40yrs). All data were normally distributed and the mid luteal serum progesterone levels showed a range from 4.2-190nmol/L with a mean of 57.5nmol/L.

Centile distribution of the mid-luteal serum progesterone levels showed that 2.5th centile (20.53nmol/L, 95% CI=14.55-23.25) detected 97.5% of ovulatory cycles (Fig.1).

There were 97.1% of conception cycles and 97.9% of non-conception cycles above this cut-off. Furthermore, in the conception and non-conception cycles, the mean mid luteal serum progesterone level was 79.89nmol/L and 66.43nmol/L, respectively (p=<0.001) (Fig.2).

Subgroup Analysis

Subgroup analysis of the conception cycles showed mean mid luteal serum progesterone value 79.08nmol/L and 79.53nmol/L for live births (LB) and early pregnancy loss (EPL) (includes biochemical miscarriages, no ectopics in this group) respectively (p=0.977)(Fig.4).

There were 48% conception cycles and 60% non-conception cycles above the value of 60nmol/L (Fig.5). Higher midluteal serum progesterone values does not appear to be associated with better pregnancy outcomes.

Conclusions

• As this is the first study where cycles were tracked and tested for ovulation, the values derived from this study are more valid in deducing the lower limit for single measurement of mid-luteal serum progesterone to indicate probable ovulation.
• Contrary to the traditional belief of luteal phase defect being associated with early pregnancy loss; our data shows early pregnancy loss cycles were associated with higher luteal serum progesterone. This interesting finding opens a new area for further research.