FSH (Follicular stimulating hormone) is an important hormone in the natural menstrual cycle. Its main function on the ovary is to aid in the recruitment and maturation of the primordial follicles to mature oocytes. FSH secretion is crucial in the first week of the follicular phase of the cycle. FSH induces oestradiol secretion at the level of ovary by activating aromatase enzymes. It also induces proliferation of granulosa cells and expression of LH receptors on the granulosa cells and exerts a negative feedback on GnRH secretion. As reproductive age advances to the menopause, the menstrual cycle decreases in length, predominantly due to a shortening of the luteal phase. With increasing age, FSH concentrations gradually increase in women. The rise in FSH is considered to reflect depletion of the ovarian follicular pool leading to a diminished production of oestradiol and inhibin-B.

### RESULTS

Median FSH remained consistently low (<5 U/L) in women <35 years of age and was 6 U/L in those 35-40 years old. The mean FSH and 97.5th percentile increased steadily. The 97.5th centile was 10 U/L or lower in women up to 30 years and was 17 and 59 U/L for women up to 35 and 40 years respectively.

The average of each 200 FSH values with increasing age was as follows:

- **Age 20-25**: Median FSH was 4.8 U/L.
- **Age 25-30**: Median FSH was 5.5 U/L.
- **Age 30-35**: Median FSH was 6.5 U/L.
- **Age 35-40**: Median FSH was 7.5 U/L.
- **Age 40-45**: Median FSH was 8.5 U/L.
- **Age 45-50**: Median FSH was 9.5 U/L.
- **Age 50-55**: Median FSH was 10.5 U/L.
- **Age >55**: Median FSH was 11.5 U/L.

### DISCUSSION

Research has shown that menopausal age is preceded by a period of reduced fertility related to a decreased follicle pool, a reduced cohort of growing follicles and diminished oocyte quality. This process begins from early 30s.

Our study assessed the variation of median FSH levels with age. In this study, the median FSH did not increase and remained constant until the age of 45 years suggesting that this is likely to be a later marker of ovarian reserve. In contrast, AMH begins to decline much earlier and has been shown to be a better marker of ovarian reserve.

The strengths of this study are the use of community based women and the large sample size, FSH data was not restricted to a particular day in the menstrual cycle. However, the exclusion criteria were designed to provide samples that would most likely represent the follicular phase.

### CONCLUSION

In this study, the median FSH did not increase significantly over 10 U/L until >45 years of age. If fertility is of concern, FSH levels persistently greater than the median of 5 U/L in those <40yrs of age may prompt earlier follow up with more sensitive markers such as AMH.

This study may prompt discussion of our interpretation of FSH levels over 10 U/L in younger women. Age related ranges or medians may be more helpful in interpreting FSH as a predictive marker of ovarian reserve. FSH levels > 5 U/L in women 25yrs and younger should prompt earlier follow up given such levels are well above the 97.5 percentile for this age group.

### REFERENCES

2. Discordances between FSH and AMH in female infertility. Glieker et al, Reprod Biol & Endo. 2010; 8, 64

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