The Measurement Of Urinary Gonadotrophins For Assessment And Management Of Pubertal Disorders

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Introduction

An increasing need for non-invasive, out-patient based investigations has necessitated a re-evaluation of urinary gonadotrophins (uGn) for assessing puberty. Prospective evaluation of the relationship between first morning urinary uGn measured by immunoassay and corrected for creatinine (uLH:uCr; uFSH:uCr), and basal serum gonadotropins (sLH, sFSH) and in response to LHRH stimulation test. Prospective evaluation of uGn trend in patients receiving GnRH analogue (GnRH-a)(Decapeptyl SR, 11.25 mg, every 10-12 weeks).

Methods

20 (15 M) patients evaluated for delayed puberty, 15 (1M) for suspected precocious puberty and 18 (3M) on GnRH-a. Three first morning urine samples on 3 mornings before the stimulation test or before the 10-12wkly GnRH-a injections were collected. For patients on treatment, 3 samples were also collected at the mid-point between injections. Data were expressed as median (range).

Results

A significant correlation was found between basal sLH and uLH:uCr (ρ, 0.7; p<0.0001) and basal sFSH and uFSH:uCr (ρ,0.72; p<0.0001). (Fig 1).

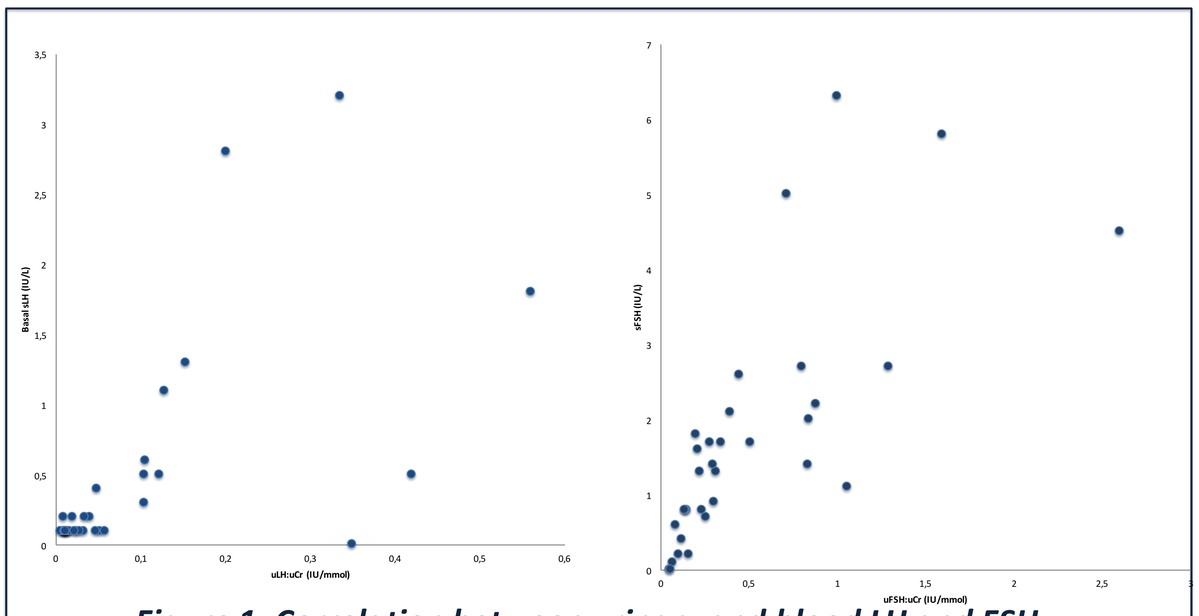
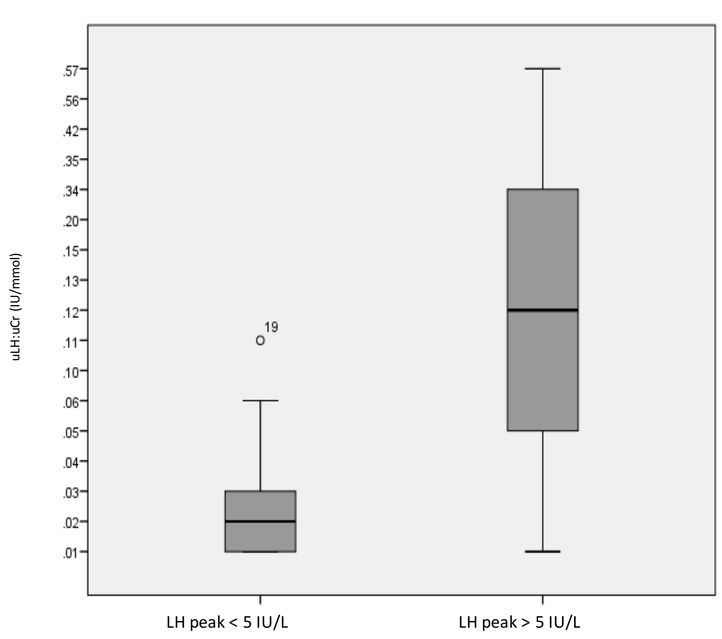


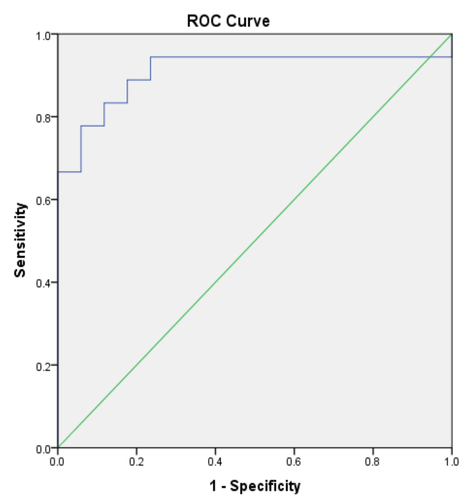
Figure 1: Correlation between urinary and blood LH and FSH

A significant difference was found in uLH:uCr values according to LHRH test peak < or > 5UI/L (p<0.01) (Figure 2)



Based on ROC curve analysis a uLH:uCr value of 0.032 IU/mmol as a cut-off would detect a sLH peak >5 UI/L (sensitivity: 87%; specificity: 86%; AUC: 0.9) (Fig.3).

Figure 3: ROC curve for analysis of uLH:UCr cut-off value to achieve a LH peak greater than 5 IU/L.



CoV of samples collected before treatment was 0.27 (0-1.4) for uLH:uCr and 0.24 (0.05-0.99) for uFSH:uCr.

On treatment, uLH:UCr CoV of samples collected before the injection and at mid-point was 0.29 (0.14-0.85) and 0.33(0.04-0.63), respectively, while for uFSH:UCr, CoV was 0.24 (0.13-0.52) and 0.4 (0.08-1.3).

Median uLH:UCr and uFSH:UCr before the injection (0.01 IU/mmol; 0.34 IU/mmol) were significantly higher than at mid-point (0.008 IU/mmol; 0.09 IU/mmol) (p: 0.000 and p: 0.000) (Fig. 4).

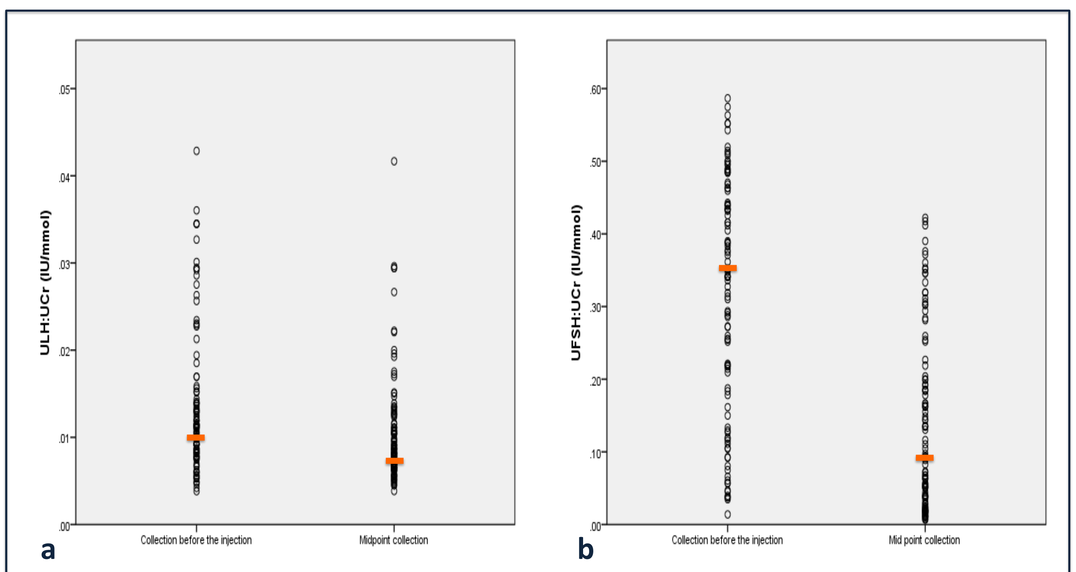


Figure 4: Comparison between uLH:uCr (a) and uFSH:uCr (b) values before the injection and after 5/6 weeks. Median values represented with red line.

Conclusions

UGn reflect serum gonadotrophin concentrations and may represent a useful non-invasive method of assessing puberty and monitoring effectiveness of puberty suppressive therapy.

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