Influence of a tryptophan-rich diet on prostatic growth and androgen receptor expression

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BACKGROUND
- Benign Prostatic Hyperplasia (BPH) is a pathology with high prevalence whose etiology has not yet been clarified
- Recent studies revealed that serotonin (5-HT) inhibits benign prostatic growth through modulation of the androgen receptor (AR).

OBJECTIVE
- To investigate the hypothesis that modulating the plasmatic levels of 5-HT through a tryptophan-rich diet (aminoacid precursor of 5-HT synthesis), could regulate prostatic growth.

METHODOLOGY
- 18 C57BL adult mice were divided in 2 groups according to diet (normal vs tryptophan-rich diet) for a 3-month period (Fig 1). After mice sacrifice, the prostates were dissected and weighted. Prostatic serotonin was quantified by ELISA and a Western Blot, to evaluate the androgen receptor expression. IBM SPSS Software, v23.0 was used in all the statistical analysis and a p-value <0.05 was considered significant.

RESULTS
Mice fed with the tryptophan-rich diet were associated with:
- inferior prostatic weight (p = 0.009) (Fig 2).
- superior intra-prostatic serotonin concentrations (p = 0.001) (Fig 3).
- inferior expression of androgen receptors in prostatic tissue (Fig 4).

Fig. 2 - The tryptophan-rich diet reduced the size of the mouse prostate. Comparison between prostatic index in mice fed for 3 months with normal diet (n = 9) vs. mice fed with a tryptophan-rich diet for 3 months (n = 9).

CONCLUSIONS
- Tryptophan-rich diet increases plasma serotonin and decreases prostate size by modulating the androgen receptor.
- These results suggest that dietary manipulation of tryptophan may be explored in the prevention and treatment of BPH.