1: Clin Endocrinol (Oxf). 1998 Aug;49(2):203-7.

L-5-hydroxytryptophan does not stimulate LH secretion directly from the pituitary in patients with gonadotrophin releasing hormone deficiency.

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OBJECTIVE: There is abundant histological and physiological evidence that serotonin plays a role in the regulation of LH secretion in rats. Studies in human subjects have been few, but their results include the finding that pulsatile administration of L-5-hydroxytryptophan (5-HTP, the immediate precursor of serotonin) amplifies LH secretion in women in the medium-late follicular phase, and that this effect is not due to 5-HTP directly inducing LH secretion by the pituitary. We have investigated whether 5-HTP amplifies LH secretion by enhancing the response of the pituitary to GnRH. PATIENTS: Seven patients aged 20-40 years with hypogonadotrophic hypogonadism (HH) of hypothalamic origin (3 men with Kallmann's syndrome, 2 women without anosmia and with GH deficiency, and 2 women with anorexia nervosa). DESIGN: To prime the pituitary, subcutaneous pulsatile GnRH was administered for 7 days at the rate of one 5-20 micrograms pulse every 90 min. The day before the investigation, this regimen was replaced by 1.5-3 micrograms intravenous pulses at the same frequency. On the day of the investigation, 3 ml blood samples were taken every 10 min from 0850 to 19:00 hours. After the first two samples, the intravenous GnRH pulse frequency was increased to one per hour and was maintained at this level throughout the rest of the study. The first 4 h of the study acted as a control phase allowing determination of the pituitary response to GnRH. At 1300 h, 75 mg of the aromatic-L-amino-acid decarboxylase inhibitor carbidopa was administered orally; carbidopa does not cross the blood-brain barrier, and prevents peripheral conversion of 5-HTP to serotonin. At 1600 h, another 75 mg dose of carbidopa was administered, and administration of 8-20 mg pulses of 5-HTP at a rate of one pulse per hour was begun. MEASUREMENTS: LH was determined in triplicate by an immunoradiometric assay (IRMA), and LH pulses identified by means of a program developed in our laboratory. RESULTS: When pulsatile administration of GnRH was accompanied by administration of carbidopa and 5-HTP, LH pulse amplitude (2.32 +/- 0.71 IU/l) did not differ significantly from its value in either the GnRH+ carbidopa phase (2.58 +/- 1.12 IU/l)

or the unaccompanied GnRH phase (2.77 +/- 1.76 IU/l).
CONCLUSIONS: L-5-hydroxytryptophan-induced amplification of LH secretion in humans is not due to enhancement of the pituitary response to GnRH. The effect of L-5-hydroxytryptophan must therefore be due to its action on the hypothalamus, where it may be hypothesized that it increases GnRH release.

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