

Is there Hypothalamic - Pituitary - Gonadal Dysfunction in Paedophilia? A Pilot Study

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Summary: The hypothalamic - pituitary - gonadal axis was evaluated in men with paedophilia and non-paedophilic paraphilia, and in normal male controls, by infusion of 100 mcg. of synthetic luteinising hormone-releasing hormone (LHRH). There were no significant differences among groups in age, height, weight, testosterone, baseline luteinising hormone (LH) and follicle stimulating hormone (FSH), and FSH response to LHRH. However, there was a significant difference between the paedophilic group and the other two groups in the LH response to LHRH. The paedophiles responded with a marked elevation of LH, when compared with the non-paedophilic paraphiliacs and controls. These data indicate a hypothalamic - pituitary - gonadal dysfunction in paedophiles.

In a paper entitled "The Sex Offenders' Endocrines", Wright (1939) described a "biological factor" involved in the deviant sexual behaviour of homosexual paedophiles. He examined three hormones by crude biological assay—androtin, oestrin, and gonadotrophin—finding that one or more of these hormones was abnormal in many paedophilic sex offenders. Despite more knowledge of endocrinology and more sophisticated hormone assays, little more has been learned since Wright's study about the function of endocrine systems in those with sexual deviance (Bancroft, 1977).

Most endocrinological approaches to sexual deviance have investigated testosterone (Rada, 1980). Although androgen-depleting agents are useful in controlling paraphilia (Money, 1970; Bancroft *et al*, 1974; Berlin & Meinecke, 1981), there is little evidence that measurable testosterone is invariably altered in sexual deviancy (Rada *et al*, 1976; Rada, 1980).

Hormones other than androgens are involved in sexual behaviour: reports indicate that synthetic luteinising-hormone releasing hormone (LHRH) stimulates sexual behaviour in animals (Pfaff, 1973; Moss & McCann, 1973); however, the effect of LHRH in man is unclear (Evans & Distiller, 1979). Another investigation, measuring endogenous luteinising hormone (LH), found an increase during sexual excitement in man (LaFerla *et al*, 1978). Since these two polypeptide hormones are involved in hypothalamic—pituitary—gonadal (HPG) function, and possibly in sexual behaviour, it might be of value to investigate other indices of HPG integrity in abnormal sexual behaviour rather than to focus on one part of the axis, i.e. testosterone.

Several studies offer conflicting evidence of HPG dysfunction in patients with sexual disorders; one which measured LH and follicle stimulating hormone (FSH) in transvestism did not reveal abnormalities (Buhrich *et al*, 1979). Several men with transsexualism exhibited an abnormal LH response to LHRH, although the group result was not statistically different from that of controls (Boyar & Aiman, 1982).

Thus we felt it would be informative to investigate HPG integrity in those with paedophilia, by challenging the pituitary with an infusion of exogenous LHRH.

Method

Patients were consecutive male in-patient admissions to the Biosexual Psychohormonal Clinic at the Johns Hopkins Hospital. Criteria for the study were as follows:

(1) Inclusion criterion

- a. Meeting the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, third edition, criteria for paraphilia (1980)

(2) Exclusion criteria

- a. No obese patients nor patients with recent weight loss.
- b. No use of psychotropic nor anti-convulsant medication; no heavy use of ethyl alcohol.
- c. No diagnosis of schizophrenia, affective disorder, or temporal lobe epilepsy.
- d. No stigmata of Klinefelter's syndrome. No micropenis, no testicular abnormalities.

Since there is evidence that paedophilia has a different age of onset and a different course, when contrasted with the non-paedophilic paraphilias (Frosch & Brimbers, 1939; Revitch & Weiss, 1962; American Psychiatric Association, 1980), and since paedophilia is unlike the other paraphilias clinically, in that the person is sexually aroused by children, those with sexual deviancy were divided into two groups—paedophilia

and non-paedophilic paraphilia. Twelve in-patients meeting all criteria were studied; five had non-paedophilic paraphilia; seven had paedophilia. Of the non-paedophilic paraphilia group, one had voyeurism, one had fetishism, two had exhibitionism, and one had mixed exhibitionism and voyeurism. Of these, four were heterosexuals, one was bisexual; all were interested in adults. Controls were hospital employees, medical students, or relatives of hospital employees, all without paraphilia.

The protocol—approved by the Johns Hopkins Committee on Clinical Investigation—consisted of an indwelling venous cannula for blood drawings, inserted into an antecubital vein at 10 a.m. (± 30 minutes); 5% dextrose and water dripped into the cannula IV at a rate to keep the vein open. Two baseline LH and FSH samples were obtained at 15-minute intervals; a testosterone level was drawn before LHRH infusion. 100 mcg. of LHRH ('Factrel,' Ayerst), was infused as an IV bolus over 1–2 minutes. Subsequent LH levels were drawn at 15, 30, 45, and 60 minutes post-drug; FSH levels were drawn at 30 and 60 minutes post-drug. The IV was then replaced by a heparin lock during the last 60 minutes before a final 120 minute sample for LH.

Laboratory assays were done independently from and blind to, clinical assessment. FSH and LH assays were done in duplicate by an antibody radioimmunoassay (RIA) method (Penny *et al.*, 1970). Testosterone was also measured by RIA (DeLecarda *et al.*, 1973). Data were analysed by means of a Kruskal-Wallis single variable test (Hollander & Wolfe, 1973) or an analysis of variance where appropriate.

Results

Table I presents results of patients and control data on age, height, weight, and testosterone measurements; age, weight, and height, were similar among groups. Although the control group testosterone was higher than the other two groups, there was no statistically significant difference.

Mean FSH for paedophiles rose from 309 ± 75 ng/ml immediately before LHRH infusion (0 minutes) to 630 ± 182 ng/ml at 60 minutes after LHRH. Mean FSH for non-paedophilic paraphiliacs increased from 222 ± 56 ng/ml at 0 minutes to 287 ± 64 ng/ml at 60 minutes post LHRH. Control's

TABLE I
Characteristics of the three groups

	Age yrs	Height cm	Weight kg	Testosterone ng/100 ml
Paedophilia \pm $n = 7$	31 5	178 2	74 4	506 40
Non-paedophilic Paraphilia \pm $n = 5$	28 5	184 6	79 5	498 101
Control \pm $n = 5$	33 3	180 2	81 4	599 81

Values are means \pm SEM. No significant differences (ANOVA)

mean FSH increased from 140 ± 33 ng/ml at 0 minutes to 238 ± 52 ng/ml at 60 minutes after LHRH. Despite both higher levels of FSH at baseline and a more vigorous response of FSH to LHRH in the paedophiles, there was no statistically significant differences among groups at any baseline (-15 and 0 minutes) or treatment period (+30 and +60 minutes after LHRH).

Results of the LH response to LHRH are found in Table II. At baseline (0 minutes), LH for controls was 43 ± 4 ng/ml, for nonpaedophilic paraphiliacs 61 ± 17 ng/ml, for paedophiles 51 ± 11 ng/ml (not statistically different). However, after LHRH stimulation there were statistically significant differences between groups at +15, +30, and +120 minutes. For

TABLE II
Effect of LHRH on LH in paedophilia

Minutes	Baseline		Treatment				
	-15	0	+15	+30	+45	+60	+120
Group							
Control	42	43	180*	216*	176	167	117*
\pm	3	4	28	31	23	19	14
$n = 5$							
Non-paedophilic Paraphilia \pm	65	61	179*	229*	215	210	119*
$n = 5$	14	17	23	8	17	22	14
			(3)		(4)		
Paedophilia	57	51	350*	469*	398	344	343*
\pm	13	11	80	100	85	79	92
$n = 7$							(6)

100 mcg. LHRH Bolus at 0 minutes. Values are means in LH ng/ml \pm SEM. Exceptions to N are noted in parenthesis.

* $P < 0.05$, Kruskal-Wallis Test, between groups.

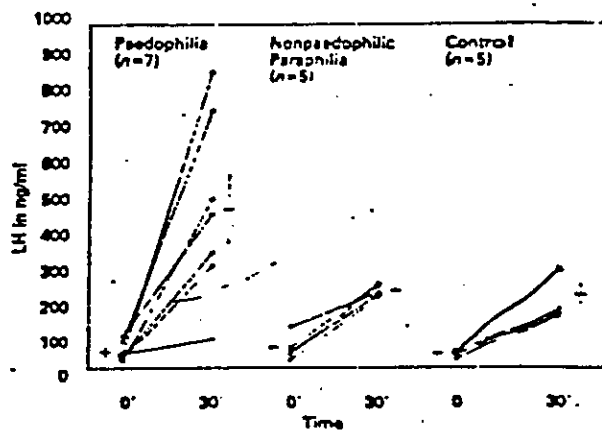


FIG. 1—Effect of 100 Mcg LHRH on LH in paedophiles, non-paedophilic paraphiliacs, and normal controls.

Lines connect individual patient LH values at baseline (0 min), and 30 min following intusion of 100 mcg of LHRH, in each of the three groups. Bar indicate group means \pm SEM. For 30 min values, $P < 0.05$.

example, at 30 minutes post-LHRH, LH for controls was 210 ± 31 ng/ml, for non-paedophilic paraphiliacs 229 ± 8 ng/ml, for paedophiles 469 ± 100 ng/ml, ($P < 0.05$), (Fig. 1). By inspection, the control and non-paedophilic paraphilia group had similar responses, a modest increase of LH; however, the paedophilia group had a marked hypersecretion of LH in response to LHRH (Table 11, Fig. 1).

Discussion

The finding of a markedly abnormal LH response to LHRH in the group with paedophilia documents a specific endocrinological abnormality in a group of patients with sexual deviancy as the primary diagnosis. Since this group represents a sub-population of paedophiles, the results should be considered preliminary until replicated; nevertheless, it was the case that there were significant differences in response between the paedophilic group, contrasted with the non-paedophilic paraphilic group. These data indicate that not only are there clinical differences, but also endocrinological differences, between one group of men whose sexual activity—albeit deviant—was directed toward adults, compared with another group who were sexually aroused by children.

The groups of paedophiles and non-paedophilic paraphiliacs were selected sub-populations; they were non-incarcerated (although one patient in each group was recently in municipal jail for a short time before entering the hospital) non-violent in-patients. Since admission biases were equal for both groups, it appears likely that the differences in LH response are not due to selection biases. Another possible bias between groups is gender preference in sexual activity. In both the control group and non-paedophilic paraphilia group, all five men were sexually attracted to women; in the paedophilic group, six out of seven were attracted to women, but in addition, five found young boys, one found young girls, and one found children of both sexes to be erotically appealing. A preponderance of homosexual paedophiles might bias the results, but in a report on the response of LH to LHRH in homosexuals compared to heterosexuals, no differences were found (Livingstone *et al.*, 1978).

The response of LH to LHRH in paedophiles is similar to the response of LH in patients with Klinefelter's syndrome given LHRH (Smals *et al.*, 1976; Harman *et al.*, 1982). However, the paedophiles showed no stigmata of Klinefelter's syndrome: furthermore, the baseline LH was not elevated and baseline testosterone was not lowered—manifestations of primary hypogonadism—as one would expect in Klinefelter's syndrome. Notably, as a group, the Klinefelter patients come to psychiatric and legal attention more than one would expect (Schroder *et al.*, 1981). The psychiatric problems which Klinefelter patients often manifest disproportionately include

paedophilia (Mosier *et al.*, 1960; Nielsen, 1970; Wakeling, 1972; Berlin, 1982). Thus, it is possible that the HPG axis dysfunction in paedophilia and in some Klinefelter patients may be of pathophysiological significance.

As noted in a recent paper on anterior pituitary secretion in chronic schizophrenia (Ferrier *et al.*, 1983), the pituitary responses to hypothalamic-releasing hormones are potentially valuable in three ways: as a diagnostic and therapeutic marker, as an aid in understanding pathophysiological processes, and as evidence for association between psychiatric illness and hormonal changes and imbalances. Certainly, this report indicates an association between psychiatric illness and a hormonal imbalance, and possibly may aid in understanding pathophysiological processes, but more extensive investigations are needed before the LHRH test can be proclaimed as a diagnostic marker. A further application which would be especially relevant in paraphilia, where hormonal imbalances may have an effect on the pathological behaviour, is that analysis of endocrinological abnormalities may lead to new alternatives for treatment.

Although preliminary, our results indicate that HPG response to LHRH is different in paedophiles, when compared to non-paedophilic paraphiliacs and to normal controls. Since the HPG axis has a tonic balance, the aberrant response of LH to LHRH indicates there was hypothalamic—pituitary—gonadal dysfunction in this group of paedophilic patients.

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