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NEUROHYPOPHYSEAL FUNCTION IN EARLY POST-OPERATIVE
DIABETES INSIPIDUS.

Diabetes Insipidus (DI) following surgery to the pituitary or
hypothalamus may be transient, prolonged or show a triple response.

We have investigated 11 children (1.8-15 yrs) following such
surgery. Plasma vasopressin (AVP), human neurophysin I (HNPI)
and oxytocin (OT) concentrations were determined at the onset of
DI and daily thereafter. Water deprivation tests were performed
on day 6 and 14. All had corticosteroid and thyroxine replacement.

9 patients developed early post-op DI (onset 1-12 hrs). Initial
plasma AVP levels were high 3.9 ± 1.2 pmol/L and fell to $1.1 \pm$
 0.2 pmol/L by the 2nd day ($P < 0.05$). HNPI concentrations also fell
from 0.7 ± 0.2 ng/ml to 0.2 ± 0.1 ng/ml ($P < 0.05$) whereas plasma
OT levels remained unchanged. HPLC performed on day 1 plasma
revealed a major peak co-eluting with synthetic AVP and two small
er peaks of immuno reactivity.

Water deprivation tests showed no differences between patients
with a triple response or uninterrupted DI. Taken together, final
plasma AVP concentrations on day 6 (0.8 ± 0.5 pmol/L) were similar
to those on day 14 (0.5 ± 0.1 pmol/L). Maximal urinary AVP excre-
tion on day 6 (2.4 ± 0.8 pmol/hr) was significantly ($P < 0.05$)
greater than on day 14 (0.7 ± 0.3 pmol/hr).

Early post-op DI is not due to reduced circulating AVP but may
be related to release of biologically inactive precursors.

The difference in urinary AVP excretion between days 6 and 14 is
insufficient to explain the resolution phase of the triple response.

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PULSATILE PROLACTIN SECRETION IN HYPOTHALAMIC-
PITUITARY DISORDERS

We have studied nine children with a variety of hypothalamic
pituitary disorders and delayed puberty, before and during
nocturnal pulsatile GnRH therapy given subcutaneously in a dose
of 2 - 4 µg every 90-120 minutes. Initial age ranged from
13.5 - 18 years. The duration of therapy was >0.5 years. Over-
night serum profiles of prolactin, growth hormone and
gonadotrophins were obtained by blood sampling at 15 minute
intervals.

In the three severely growth hormone deficient patients there
were very low levels of prolactin (0-150 mIU/L), without
appreciable pulsatility or sleep-related rise. In the remainder
there was no clear relationship between prolactin levels and
GnRH or gonadotrophin pulses. In those patients with normal
growth hormone secretion, including two with isolated gonado-
trophin deficiency, there was a temporal relationship between
growth hormone and prolactin pulses.

These results therefore seem to contrast with data from adult
studies, in that pulsatile prolactin secretion was more related
to growth hormone status and release than to GnRH or gonado-
trophins. This may have important implications for our
understanding and management of hypothalamic-pituitary disorders.

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ENHANCING HYPOTHALAMIC LESIONS SHOWN ON HIGH
RESOLUTION COMPUTERIZED TOMOGRAPHY IN PATIENTS WITH
IDIOPATHIC HYPOPIUITARISM

No cause is defined in the majority of children with hypo-
pituitarism and they are labelled as 'idiopathic'. Five patients
3 boys and 2 girls, aged from 2 to 22 years, underwent high
resolution (GE9800) CT scans of the hypothalamic and pituitary
regions. Four had pan-hypopituitarism, 1 with diabetes
insipidus and 1 had isolated GH deficiency. Peak GH responses
to hypoglycaemia (ITT) or glucagon were less than 5 mU/L and
after bolus GHRH (1-29)NH₂ in 3 patients, GH was 11.8, 11.5
and 10.2 mU/L, indicating hypothalamic GHRH deficiency. In 1
patient peak cortisol during ITT was 275 nmol/l compared with
690 nmol/l after bolus CRF 1-41 infusion. Prolactin levels
were elevated in all subjects ranging from 562 to 1329 mU/L
(normal value less than 360 mU/L). In each case CT scan
demonstrated a definite enhancing lesion in the anterior
hypothalamus, situated in the floor of the third ventricle,
adjacent to the chiasm or in the region of the tuber cinereum.
In 4 patients the pituitary gland was small. Biopsies were not
performed. Repeat scan after 18 months in 2 subjects showed no
change. Thus apart from hypopituitarism, the lesions produced
no symptoms. We suggest that these may be of aetiological
significance, correlating with endocrine evidence of hypothal-
amic dysfunction.

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MAGNETIC RESONANCE (MR) AS AN ADDITIONAL DIAGNOSTIC TOOL
FOR HYPOTHALAMIC HAMARTOMA.

Hypothalamic hamartoma (HH) is assumed to be made of normal neuronal
tissue ectopically located, and is often associated with true precocious
puberty (PP). Its recognition is of great importance as this tumor does
not require irradiation and is generally not invasive. Diagnosis is
based on the following criteria: 1) the localisation to the floor of
3rd ventricle; 2) the CT scan appearance as a mass isodense to gray
matter before and after injection of contrast media; 3) the absence of
elevated circulating levels of hCG and α-feto-protein; 4) the lack of
extension on follow-up. The contribution of MR was investigated in 7
cases (6 with PP and 1 with gelastic epilepsy). In 6 out of 7 cases the
tumor signal was compared to that of gray matter: 1) it was identical
on T₁ weighted images; 2) but it was superior on T₂ indicating some
structural difference. A hamartoma like structure was found at biopsy in
one of these cases. The last case showed a signal intensity identical to
normal cerebral tissues.

In conclusion, these MR data provide a new diagnostic tool in addi-
tion to the other biological, clinical and CT scan data. They also
suggest that HH might have a structure different than normal brain
tissues.

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RELATIONSHIP OF PLASMA GROWTH HORMONE RELEA-
SING HORMONE (GHRH) LEVELS TO PUBERTAL CHANGES

Basal plasma GHRH levels were determined by RIA, as
previously described, (Donnadieu, JCEM 60:1132, 1985)
after an overnight fast in 93 normal boys and 87 normal
girls aged 8 to 18 years. Sixteen boys with idiopathic
delayed puberty (IDP) were also studied. Plasma GHRH
levels increased above prepubertal values during the
teenage years. At mid-puberty GHRH levels in girls
(mean ± SEM) were 159.1 ± 28.5 pg/ml, 5 fold the pre-
pubertal values (30.0 ± 4.3), and in boys 101.4 ± 11.5
pg/ml, 2 fold the prepubertal values (48.1 ± 5.2). Basal
GHRH levels of boys with IDP were significantly
lower (20.5 ± 5.2 pg/ml). In addition, boys with IDP
presented a failure of response of plasma GHRH after
L-Dopa stimulation. The sharp rise of plasma GHRH le-
vels during puberty in both sexes suggests a role for
this peptide in the adolescent growth spurt. The low
basal GHRH levels and its impaired release after L-
Dopa stimulation in IDP suggest a possible hypothalamic
dysfunction in this syndrome.

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hGH RESPONSE TO REPEATED GH-RH 1-44 ADMINISTRATION IN
HYPOPIUITARY CHILDREN

The aim of the present investigation was to determine the effec-
tiveness of 1 daily s.c. injection for 5 consecutive days of GH-
RH 1-44 (1 mcg/Kg) on the plasma hGH response to an i.v. bolus of
GH-RH 1-44 (1 mcg/Kg) in hypopituitary patients who had a sub-
normal response of plasma hGH to previously performed tests: ITT,
clonidine, sleep. The i.v. GH-RH test was performed before (I)
and day after (II) the last i.m. injection.

Eleven children (7 IGHD, 4 MPHD) were studied. According to
the results the patients were sub-divided into 3 groups:

GR	n	CA	BA	Peak Plasma hGH ng/dl	p	
				I. GH-RH	II. GH-RH	
I	4 (1M+3F)	13.0±4.9	9.9±3.7	11.7±4.9	22.9±7.3	.05
II	5 (4M+1F)	8.9±2.6	6.1±4.1	12.6±4.0	13.2±5.3	NS
III	2 (2F)	7.5±3.3	5.0±3.1	2.5±0.8	2.8±0.7	NS

In GR I 3 girls were in puberty and the peak response of hGH
to other tests was 5.1 ± 1.9 . In GR II 4 boys were prepubertal, had
a lower peak of hGH in other tests 2.3 ± 0.9 , whereas in GR III
there was no rise in any test. This investigation indicates a)
that repeated administration of GH-RH even in small doses is use-
ful in the differentiation of patients who may benefit from
prolonged therapy; b) that hGH responsiveness to GH-RH may be
influenced by sex hormones.