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PROGRESSIVE INCREASE IN NON-SEX HORMONE-BINDING GLOB-
ULIN (SHBG)-BOUND TESTOSTERONE (T) FROM INFANCY TO
LATE PREPUBERTY.

Sex hormones circulate in complex with two major serum pro-
teins: SHBG and albumin (HSA). We have recently reported that
there is a progressive decrease in the serum concentration of SHBG
throughout male prepuberty. A computer program was used to cal-
culate the distribution of serum T into SHBG-bound, non-SHBG-bound,
HSA-bound and free fractions in 70 normal prepubertal boys, aged
0.5 to 12 y. The calculation was derived from the experimental
measurements of serum T and SHBG assuming unique values for serum
HSA and for the affinity binding constants. Non-SHBG-bound T,
presumably the fraction of serum hormone that is available for
transport into tissues in vivo, increased progressively from 1.44 ± 0.5 ng/dl ($\bar{X} \pm S.E.$) at 0.5 y. to 10 ± 4.4 at 12 y. ($r=0.47$, $p<0.001$), before any clinical signs of sexual development became
apparent. Free T also changed in a similar fashion. These val-
ues can be compared with those of normal adult males ($n=10$) and
females ($n=7$): 390 ± 63 and 12.7 ± 1.8 respectively. It is pro-
posed that the gradually increasing androgen and estrogen milieu
of the brain created by this mechanism might be of physiological
significance in inducing the onset of puberty in normal boys.

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CLINICAL AND HORMONAL EVALUATION OF BOYS BORN WITH
UNDESCENDED TESTES DURING THEIR FIRST YEAR OF LIFE

Forty-eight boys with uni- ($n=40$) or bilateral ($n=8$) cryptor-
chidism were followed during the first year of life with informed
consent of the parents. 24 of them in study within the first 3 mo
of life (<3 mo). Evaluation at 3, 6, 9 and 12 mo. LH-RH tests (100ug
LH-RH i.v.) and basal testosterone (T) values were obtained at 3, 6
and 12 mo. An HCG test (1500 IU HCG i.m.) with determination of T,
dihydrotestosterone (DHT) and steroid precursors (P, 17OH-P, $\Delta 4$,
DHEA-S, 17OH-Preg) was performed at 12 mo of age. Age-matched con-
trol values were obtained in healthy children (C): T:n=144; LH-RH
test: n=9; HCG test: n=7. RESULTS: 29 boys remained cryptorchid
(gr I). In 19 boys (20 testes) a spontaneous descent occurred (gr
II). Of the 24 boys in study <3 mo spontaneous descent occurred
in 12 boys (12 testes). From the age of 80 days on no significant
differences could be found for transversal T, basal and peak LH
and peak FSH serum values between gr I, II and C, nor for the same
but longitudinal values between gr I and II. A positive correla-
tion ($p<0.01$) was found between the basal LH/T ratio as well as
peak LH/T ratio and age in gr I and II. No differences were found
in gr I, II and C for basal and peak T, DHT, P, 17OH-P, $\Delta 4$, DHEA-S
and 17OH-Preg. WE CONCLUDE that spontaneous descent during the
first year of life occurs in 40-50% of all cases. Our hormonal
data do not support the theory of a insufficient hypothalamo-
pituitary-gonadal axis in cryptorchid infants. Neither testoste-
rone biosynthesis disorders nor enzyme inhibitions were found.

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GERM CELL NEOPLASIA IN PATIENTS WITH ABNORMAL SEXUAL DIFFERENTIATION

In 7 patients, aged 7 to 19 years, germ cell neoplasia was
seen in their dysgenetic gonads. Four had male pseudohermaphro-
ditism with 46 XY karyotypes, bilateral testes, ambiguous
genitalia and persistent mullerian structures. Two had 46 XY
pure gonadal dysgenesis and one was a 46 XX true hermaphrodite
with bilateral ovo-testes. The gonads were intra-abdominal or
inguinal. The most common tumour was a gonadoblastoma, present
in 6 patients, bilaterally in 4 and oestrogen-secreting in 1.
Malignancy was seen in tissue adjacent to the gonadoblastoma
in 4 of the patients in the form of carcinoma-in-situ in the
seminiferous tubules in 2, seminoma in 1 and yolk sac tumour
with trophoblastic differentiation in 1. In one of the patients
with pure gonadal dysgenesis only dysgerminoma was seen. Five
variants of germ cell neoplasia were therefore present in these
patients who appear to be at high risk of malignancy even during
the pre-pubertal period. This reinforces the indication for
early gonadectomy in XY gonadal dysgenesis and removal of intra-
abdominal testicular tissue in true hermaphroditism.

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VULNERABILITY OF THE HUMAN LEYDIG CELL TO RADIATION DAMAGE IS AGE-DEPENDENT.

Testicular function has been studied in 3 groups of patients
previously treated for malignant disease. Group 1 consisted of
14 men treated by unilateral orchidectomy only for a testicular
teratoma (19-52 years). Group 2 consisted of 30 men treated for
a testicular seminoma by unilateral orchidectomy and post-opera-
tive radiotherapy to the remaining testis (3000 cGy over 27-28
days)(21-54 years). There were 5 young men (age 14-34 years) in
group 3, all of whom had been treated for testicular or pelvic
tumours by unilateral orchidectomy and post-operative radiotherapy
(3000 cGy over 26-35 days) between the ages of 1-4 years.

In group 2, 3 years post-irradiation, the mean basal FSH
(29.3 IU/L) and LH (17.7 IU/L) concentrations were significantly
greater and mean basal testosterone level (13 nmol/l) signifi-
cantly lower than in group 1 ($p<0.01$). All 5 males in group 3
showed grossly elevated basal FSH (>32 IU/L) and LH (>32 IU/L)
concentrations with a mean basal testosterone level (1.8 nmol/l)
significantly lower than in groups 1 and 2 ($p<0.01$). None of
the five showed a testosterone response to an HCG stimulation
test or underwent puberty spontaneously.

CONCLUSION The severe reduction in testosterone levels in group
3, compared to group 2, despite the similarity of radiation dose
received, suggests a much greater vulnerability to radiation-
induced leydig cell damage in the prepubertal boy compared with
the adult male.

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DNA ANALYSIS OF XX MALES WITH GENITAL ABNORMALITIES COMPARED TO "CLASSICAL" XX MALES.

5 male patients with a 46,XX karyotype were studied at both the
DNA level to check for the presence of Y chromosome sequences
and at the hormonal level for FSH, LH and testosterone (T). Pa-
tients were A 13 years old, B 15 1/2 years old, C 16 years old,
D 21 years old and E 23 years old. Patients A, D, E had vaginal
pouch, bilateral cryptorchidism and hypospadias. Gonadal biopsy ana-
lysis showed that all 3 patients had testis. Patients B and C
had normal genitalia with small testis. The hormonal data are
as follows:

	A	B	C	D	E	
T ng/ml	1,6	7	1,8	0,7	10,3	The T levels are variable
LH mIU/ml	13	5,8	5,8	17,5	9,4	and non linked to the phe-
FSH mIU/ml	23	18	18	20	14	nototype. LH levels are not

feed-back inhibited by T.
Southern blot analysis of the 5 patients using Y specific DNA
probe failed to detect Y DNA sequences in patients A, D, E.
Y DNA is present in the genome of the others. These data sug-
gest a heterogeneity in the XX male syndrome since we can dis-
tinguish two kinds of XX males: those with Y DNA material and
those without detectable Y sequences yet displaying abnormali-
ties in their genitalia.

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SERUM LEVELS OF FIBROBLAST GROWTH FACTOR IN CHILDHOOD
AND ADOLESCENCE: A PRELIMINARY STUDY

Basic Fibroblast growth factor (FGF) is a polypeptide of 17.000
PM, isolated from various bovine and human tissues. This factor
has a strong mitogenic activity and maintains differentiation of
mesodermic cells in vitro, but its physiological role remains un-
known. We used a radioimmunoassay (RIA) developed by Guillemín
et al. Using antibodies raised against a synthetic replicate of
[Tyr10] FGF (1-10). Our RIA intraassay and interassay coefficients
of variation were 14% and 7% respectively. 83 children, 44 boys
and 39 girls aged from 1 year 1 month to 15 years 10 months
(\bar{m} : 6 years 6 months) were studied. FGF mean value was $20,01 \pm 6,18$ pmol/ml. A great disparity of individual values was found.
No significant difference was found between boys ($18,76 \pm 6,28$
pmol/ml) and girls ($20,87 \pm 5,84$ pmol/ml). FGF values did not cor-
related with chronological age, but analysis of the results show-
ed a slightly increase of FGF values with a maximum peak in pre-
pubertal stage (10-12 years) followed by a slow decrease in puber-
tal children (12-16 years). We had previously studied 135 adults
men and women. Adult FGF levels were lower than in children
(\bar{m} : $18,34 \pm 4,44$ pmol/ml, $p<0,05$) and no sex difference was
found. Mean FGF value in blood cord of 8 neonates boys was lower
than in 116 years children (\bar{m} : $15,58 \pm 3,83$ pmol/ml, $p<0,05$).
This preliminary study suggests that seric FGF determination could
be a way to investigate the role of FGF in vivo and particularly
in growth and development.