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JOURNAL ARTICLE

# Response to acute hCG stimulation and steroidogenic potential of Leydig cell fibroblastic precursors in humans

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The process of early testosterone (T) secretion and Leydig cell differentiation in humans was studied to explore the steroidogenic capacity of Leydig cell fibroblastic precursors. Seven cryptorchid boys received hCG prior to orchidopexy. Patients CP, PB, and MR received one injection of 1000 IU; patients JR and GG, three daily injections of 1000 IU, and patients MP and MM, five daily injections of 1000 IU. A testicular biopsy was obtained at the time of operation, 24 hours after the last injection. Serum T (ng/dl) before and after hCG stimulation and testicular T (ng/g) were determined by RIA. A control prepubertal testis (tumoral orchidectomy) was incubated in vitro and showed a time-dependent accumulation of T both in the medium and the testicular tissue. Testosterone released into the medium at 1, 2, and 4 hours was 0.76, 1.43, and 4.03 ng/ml, respectively. Tissue T at 0, 1, 2, and 4 hours was 9, 11, 16, and 24 ng/g, respectively. This indicates synthesis and secretion of T into the medium. Control testes showed abundant fibroblastic precursors with scanty cytoplasm, few organelles, heterochromatic nuclei, and minute nucleoli. No Leydig cells were present. After 1 day of hCG stimulation, numerous fibroblasts were activated, displaying enlarged cytoplasms with increased numbers of organelles, nuclei rich in euchromatin, and bigger nucleoli. No Leydig cells were present. Basal serum testosterone was 58.2 +/- 45.3 ng/dl and 87.3 +/- 42.0 after hCG administration, while testicular T was 974.0 +/- 686.0 ng/g (control prepubertal testicular T is 10-50 ng/g). After 3 days of hCG, activated fibroblasts increased and immature Leydig cells appeared. Basal serum T was 35.5 +/- 7.8 ng/dl and 394.0 +/- 24.0 after hCG stimulation, while testicular T rose to 2797.5 +/- 1222.6 ng/g. After 5 days, mature Leydig cells appeared for the first time. Serum T was 58 +/- 59.3 ng/dl (basal) and 641.5 +/- 390 ng/dl (after hCG); testicular T was 789 ng/g (patient MM did not have a value for testicular T). HCG induced numerous coated pits and endocytic vesicles in activated fibroblasts and young Leydig cells, suggesting receptor aggregation and internalization of hormone-receptor complexes. Peroxidase-antiperoxidase (PAP) localization of T was positive in peritubular fibroblasts and Leydig cells.(ABSTRACT TRUNCATED AT 400 WORDS)