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PAPER CHROMATOGRAPHY OF URINARY 17-KETO-STEROIDS IN CHILDREN

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An aliquot of 24 hours urine is taken corresponding to 1.5 mg of 17-keto-steroids measured with routine methods. Sulfonconjugated steroids are obtained by solvolysis and glucuroconjugates are extracted with ethyl-acetate after beta-glucuronidase hydrolysis. Both extracts are applied to Whatman No. 2 filter paper and chromatographed in Bush systems (hexane-methanol-water for 11-desoxy-17-KS and toluene-skelly solve C-methanol-water for 11-oxy-17-KS) together with appropriate standards. Strips of the chromatograms are visualized by the Zimmerman color reaction and corresponding areas are eluted. The following steroids were thus determined: 3-beta-hydroxy-5-androsten-17-one (dehydroepiandrosterone, D.H.E.A.), androstan-3,17-dione (androsterone), etiocholan-3,17-dione (etiocholanolone), 11-hydroxy- and 11-keto-androsterone and 11-hydroxy and 11-keto-etiocholanolone.

Results obtained in 26 normal children before (I) and after (II) puberty are compared with 19 normal adults (III). D.H.E.A. is mostly sulfonconjugated, it represents 2.4% in (I), 5.2% in (II) and 5% in (III) of total 17-KS. Androsterone and etiocholanolone are sulfon- and glucuroconjugated both representing 50% in (I), 60% in (II) and 59% in (III) of total 17-KS. Androsterone/etiocholanolone ratio is near one in (I), (II) and males (III) but average 0.6 in females (III). The 11-oxy-17-KS are glucuroconjugated and represent 44% in (I), 30% in (II) and 23% in (III), furthermore the 11-hydroxy derivatives are present in larger amounts than the 11-ketometabolites. The sum of these individual compounds is only 24% of total "routine 17-KS" in (I), 76% in (II) and 84% in (III).

In 15 cases of congenital adrenal hyperplasia studied in the same way, it has been possible to describe 4 different types: androgenic (I), salt losing (II) both caused by 21-hydroxylase defect, 11-hydroxylase defect (III) and 3 beta-ol-dehydrogenase defect (IV). D.H.E.A. is 2.1% in (I), 1.4% in (II), 27% in (III) and 32% in (IV). Androsterone and etiocholanolone represent 43% of total 17-KS in (I), 13% in (II), 77% in (III) and 25% in (IV), but the androsterone/etiocholanolone ratio is in every case more than one. Total 11-oxy-17-KS represent 56% in (I), 86% in (II), 7% in (III) and 42% in (IV). The most important finding is the increased amount of androsterone compared with etiocholanolone.

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