

Reprint from

RECENT ADVANCES  
IN DOPING ANALYSIS  
(6)

W. Schänzer  
H. Geyer  
A. Gotzmann  
U. Mareck-Engelke  
(Editors)

Sport und Buch Strauß, Köln, 1999

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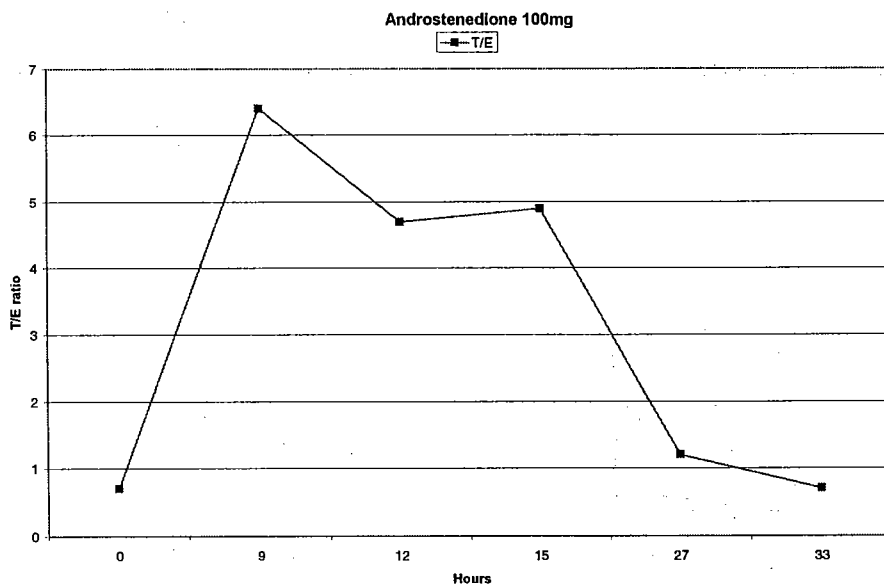
M. GARLE, E. PALONEK:  
Androstenedione: Excretion Studies from Single and Multiple Dose Experiments  
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# Androstenedione: Excretion studies from single and multiple dose experiments

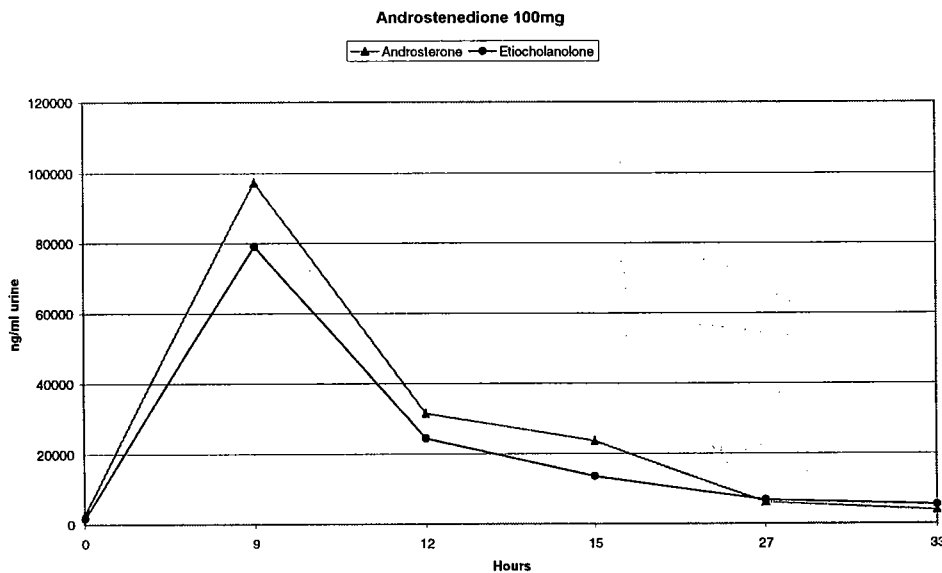
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Androstenedione ( 4-Androstene-3,17-dione ), a precursor to testosterone is sold as a dietary supplement in USA.

In Sweden and in other European countries the authorities decided to treat it as a drug and therefore it could not be sold over the counter. Still, there is a lot of private import from USA by the use of internet. To get information about the metabolism, a single excretion study was performed by intake of 100 mg Androstenedione as capsule by a male volunteer.



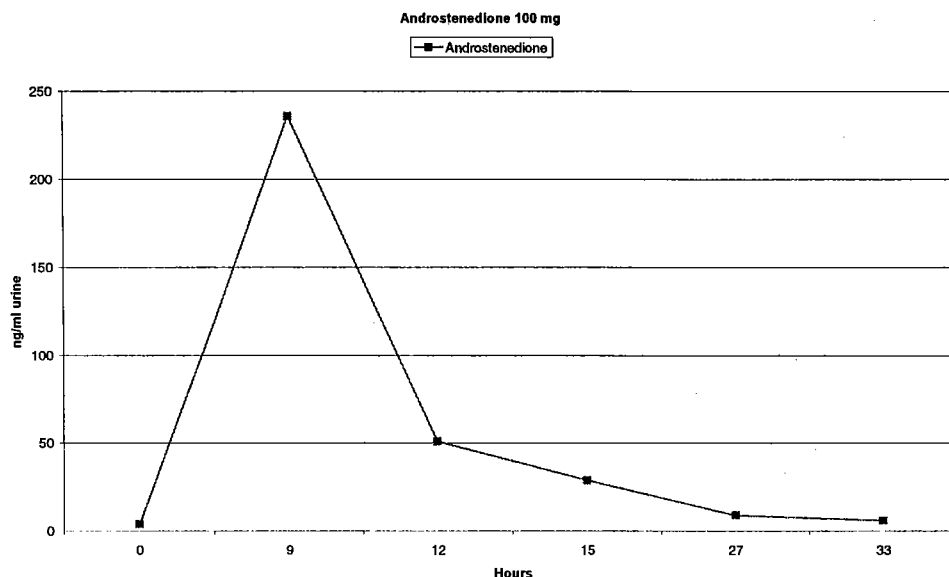
The diagram shows the increase of T/E ratio from 0.7 to 6.4 and then back to normal value again after 33 hours.



The previous diagram shows the high amounts of Androsterone and Etiocholanolone, which normally are not seen after injection of Testosterone.

Finding such results, high T/E ratio and high amounts of Androsterone and Etiocholanolone one should suspect an intake of Androstenedione.

The increase of Androstenedione concentration in urine could also be measured over time according to the next diagram.

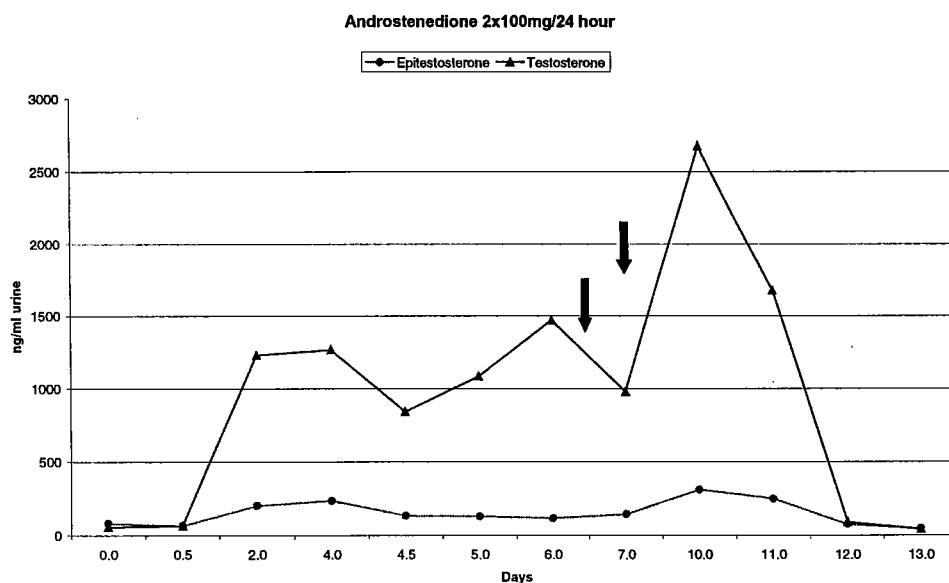


The table below illustrates measured data ( ng/ml urine ) of the steroid profile after intake of 100 mg Androstenedione.

Hour	Andro	Etioch	EpiT	T	T/E	11 $\beta$ -OH-A	11 $\beta$ -OH-E	A-dione
0	2813	1698	81	53	0,7	1290	194	4
9	97331	79156	401	2545	6,4	1617	1179	236
12	31373	24376	109	513	4,7	898	368	51
15	23591	13683	59	291	4,9	392	187	29
27	6274	6909	54	65	1,2	576	353	9
33	3940	5484	67	48	0,7	1133	314	6

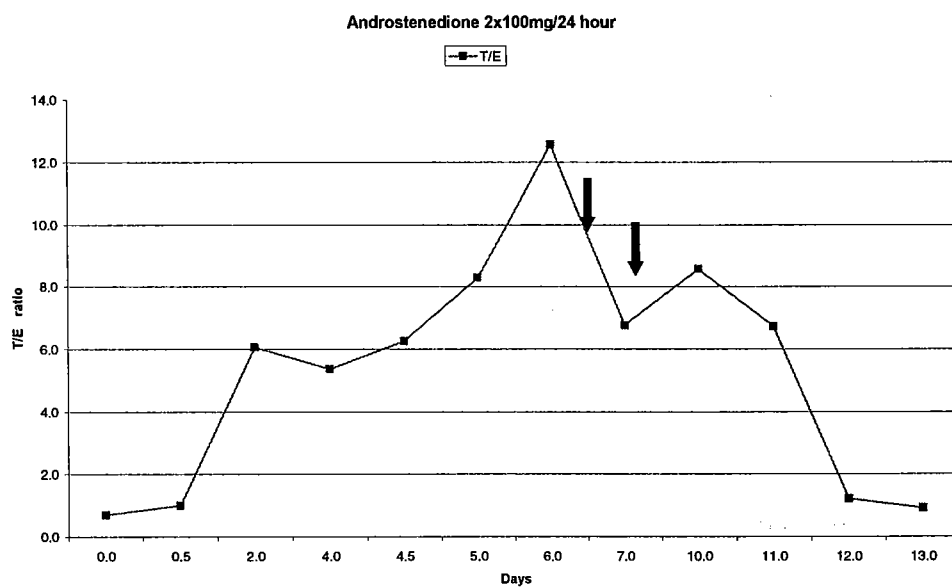
DHEA	DHT	5 $\beta$ 3 $\beta$ -diol	5 $\alpha$ 3 $\alpha$ -diol	5 $\beta$ 3 $\alpha$ -diol	5 $\alpha$ 3 $\beta$ -diol
43	47	20	133	231	67
17	230	626	1260	2559	61
16	86	195	469	1032	32
6	52	118	294	649	21
20	46	66	248	870	39
27	47	55	168	703	27

The next experiment was done by giving 200 mg of Androstenedione daily: 100 mg in the morning and 100 mg in the evening. At day 6 and 7 a dose of 10 mg Finasterid was added. Finasterid is a 5- $\alpha$  reductase inhibitor.

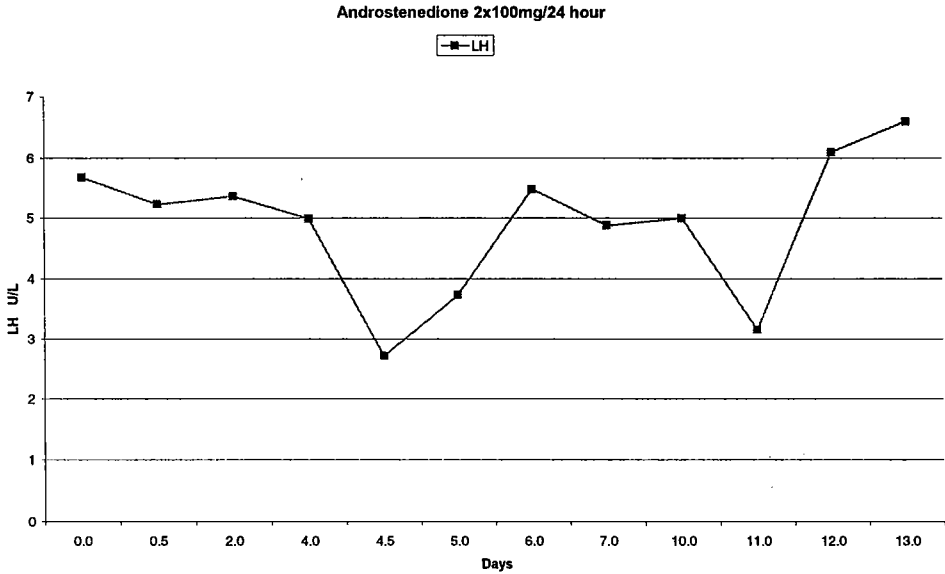


The diagram shows the Testosterone and Epitestosterone amounts over 13 days. The arrows indicate the intake of Finasterid.

The T/E ratio has changed over time according to the next diagram



During the experiment the LH was measured and you can not draw any conclusion from the results; see the diagram below.



Several new metabolites could be seen after intake of Androstenedione but no identification was done during this first study. More studies has to be done to establish the total metabolism of Androstenedione and also the influence of its intake on other known metabolites.