UNCONJUGATED ESTETROL IN NORMAL PREGNANCY

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SUMMARY

The Authors studied the levels of Estetrol (15α-hydroxyestriol) in the amniotic fluid, in maternal and foetal plasma, by the RIA method, in near-term pregnancies.

Higher concentrations of this steroid were found in the foetal plasma and in amniotic fluid than in the maternal plasma.

These data, even though of little clinical importance, confirm the foetal origin of this compound and suggest further studies, especially in the amniotic compartment.

Since Hagen [2] and Others in 1965 and Zucconi [5] in 1967 identified it, Estetrol (15 α-hydroxyestriol) has been studied to test its role in the hormonal management of pregnancy.

It has been demonstrated [4] that Estetrol is produced predominantly in the foetal liver, by 15 α- and 16 α-hydroxylation of Estradiol; for this reason it is considered one of the main indices of foetal well-being.

Once formed in the foetal liver, Estetrol is transferred to the maternal blood where it is conjugated and then excreted, above all as Estetrol-glucuronide, through the urinary tract [4].

Many Authors [1, 2, 3, 4, 5] have studied unconjugated Estetrol (Un-E_4) levels during pregnancy, but its excessive diurnal urinary variations and the practical difficulties of complete 24 hour urine collection make the urinary monitoring of Estetrol in pregnancy inexact and ineffective [4].

In particular Fishman [1] suggested that the urinary trend of Estetrol does not correspond to the production rates or to the circulating levels.

Notation [3] found mean values of 2.02 ±2.06 ng/ml in maternal plasma in 9 ca-

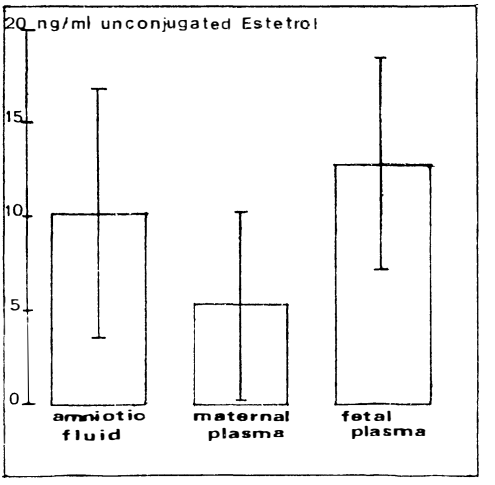
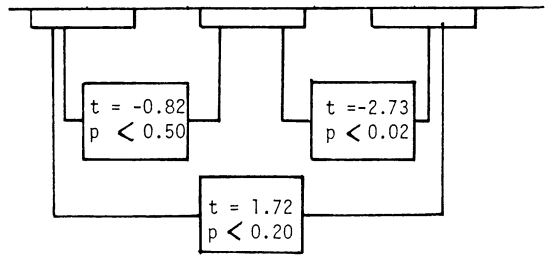


Fig. 1.

Table 1. — *Levels (ng/ml) of Un-E₄ in amniotic fluid, in maternal and foetal plasma of 10 normal pregnancies near term. Mean, S.D., t test.*

	Name	Week	Delivery	Newborn (kg)	Amniotic fluid	Foetal plasma	Maternal plasma
1)	C.L.	41	S.D.	F. 4,200	19.5	5.1	8.1
2)	M.R.	39	C.S.	F. 3,450	0.9	19.5	19.7
3)	T.M.	42	S.D.	M. 3,500	5.9	4.6	19.7
4)	R.S.	40	S.D.	F. 3,300	15.3	1.3	3.0
5)	B.L.	40	C.S.	M. 3,350	9.8	3.7	8.2
6)	R.L.	40	S.D.	M. 2,530	13.1	2.5	6.5
7)	P.R.	41	C.S.	F. 4,100	8.2	4.2	15.3
8)	M.M.	40	S.D.	F. 3,000	2.9	4.0	15.3
9)	G.A.	40	S.D.	F. 3,100	7.5	4.3	18.7
10)	S.E.	41	S.D.	M. 4,300	20.0	8.7	11.6
	MEAN ± S.D.				10.31 ± 6.55	5.79 ±5.18	12.61 ± 5.98



ses of normal pregnancy at term. Tulchinsky ([4]) found 1,200 ± 1.10 pg/ml in maternal plasma and 7,330 ± 1,414 pg/ml in amniotic fluid in normal pregnancy at term. Tulchinsky ([4]) did not find any significant difference between arterial and venous levels of Un-E₄ in cord plasma and no diurnal variations in maternal plasma.

We studied the patterns of Un-E₄ in maternal and foetal plasma, and in amniotic fluid in 10 normal pregnancies near term. Amniotic fluid was taken by transabdominal amniocentesis or puncture of the membranes during labour; samples contamined by blood or meconium were discarded. Maternal blood was obtained

in the late period of delivery; foetal blood was obtained immediately after delivery from pooled cord blood. Plasma was separated and frozen at −20 °C until assayed. The concentration of Estetrol was determined by R.I.A., the kit was supplied by Biodata S.p.A.

The data we have obtained show higher levels of Un-E_4 in the foetal plasma and in the amniotic fluid than in the maternal plasma.

As we can see, the difference between the groups has no statistical significance (amniotic fluid vs. maternal plasma: $p < 20$; amniotic fluid vs. foetal plasma: $p < 0.50$; maternal plasma vs. foetal plasma: $p < 0.02$).

Considering the discordant results obtained from maternal plasma by many Authors ([2, 3, 4, 5]) we think this is not an advisable parameter for clinical use. This is in agreement with the data of Notation and Tagatz ([3]) in complicated pregnancies.

The prevalence of Estetrol in amniotic and foetal compartments, even if not significant, is further confirmation of its foetal origin. Since amniotic fluid is the only foetal medium available during pregnancy, and since amniocentesis is employed more and more – e.g. for the investigation of foetal maturity – we suggest that further studies on Estetrol should be directed, above all, to the amniotic compartment. This could offer interesting information to the clinician, coming directly from the foetus, useful for the obstetric management of pregnancy.

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