

AMNIOTIC FLUID MUCOPROTEIN AND URIC ACID IN NORMAL PREGNANCY AND TOXAEMIA OF PREGNANCY

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SUMMARY

In the present study mucoprotein and uric acid in amniotic fluid were studied in normal pregnancy cases and in cases of toxæmia of pregnancy. It is concluded that estimation of amniotic mucoprotein and uric acid are very reliable methods of knowing the maturity and well being of foetus which is known to be at risk due to placental insufficiency in cases of toxæmia of pregnancy.

Introduction

The present study was undertaken to study the mucoprotein and uric acid in normal and in cases of toxæmia of pregnancy.

In this study an attempt was made to find out the relationship between the concentration of mucoprotein and uric acid in liquor amnii, severity of toxæmia pregnancy and the fetal prognosis in these cases.

Material and Methods

In this study mucoprotein and uric acid were estimated in cases of normal pregnancy and in cases of toxæmia of pregnancy. The cases studied were divided in the following groups:

- | | |
|---------------------------------------|------------|
| I. Normal pregnancy cases | — 75 cases |
| II. Mild pre-eclampsia | — 20 cases |
| III. Moderate to severe pre-eclampsia | — 25 cases |
| IV. Eclampsia | — 20 cases |

Newborns of all those cases who delivered in the hospital were carefully examined and their weight and appgar score was correlated with the mucoprotein and uric acid levels and the severity of disease in their mothers.

Observations

Table I shows mucoprotein content at different period of gestation in normal pregnancy.

Table II shows uric acid in liquor amnii in normal pregnancy.

Table III shows mucoprotein concentration in cases of toxæmia of pregnancy.

Table IV shows uric acid in cases of toxæmia of pregnancy.

Table V shows appgar score and mean birth weight of babies in normal and toxæmia of pregnancy.

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Accepted for publication on 16-8-85.

TABLE I
Mucoprotein Content in Normal Pregnancy Cases

Period of gestation (weeks)	No. of cases	Present indication		
		Range	Mean	SD
1. 28-32	6	91-183	141.2	± 23.10
2. 33-36	14	95-237	169.8	± 19.5
3. 37-40	55	94-281	207.3	± 13.71

$r = 0.456$ $t(73) 15.1$ $p 0.02.$

TABLE II
Uric Acid in Normal Pregnancy Cases

Period of gestation (weeks)	No. of cases	Uric Acid (mg%)		
		Range	Mean	SD
1. 28-32	6	3.3-6.2	4.23	± 0.7124
2. 33-36	14	3.9-7.1	5.6	± 0.9612
3. 37-40	55	4.5-8.3	7.36	± 0.6231

$r = 0.42$ $t(73) 4.52$ $p 0.05.$

Discussion

In the present study, a gradual rise in the mucoprotein content of liquor amnii was observed with advancement of gestation and the rise was found to be statistically significant ($r = 0.456$, $t(73)$ and $p < 0.02$). Dutta *et al* (1977) have reported average mucoprotein content in normal pregnant women as 186.2 mg%, Das Gupta (1975) in his series has reported average mucoprotein content of 155.62 mg%. In the present series it was 198.3 ± 20.66 mg%.

It was interesting to note that average concentration of mucoprotein was higher in cases of toxæmia of pregnancy as compared to normal pregnancy casts at same period of gestation. Moreover, it was found that increase in mucoprotein in toxæmia of pregnancy cases was in direct proportion to the severity of the disease.

Dutta *et al* (1977) have also reported increase in mucoprotein content of liquor in such cases. However, Das Gupta (1975) has reported mucoprotein to be slightly lesser in cases of toxæmia of pregnancy. The higher level of mucoprotein in toxæmia cases seems to be due to either active synthesis or sudden mobilization of mucoprotein from placental tissue due to various intrinsic changes in the blood vessels of placenta. Mukherjee and Sinha (1973) have attributed the rise in mucoprotein in toxæmia cases to the presence of occult meconium in amniotic fluid.

Amniotic fluid uric acid was found to increase with advancement in gestation. Wolf *et al* (1970) have also reported rise in amniotic fluid uric acid at term. They believe this rise to be due to increase in urine output by the foetus. Average serum uric acid was found to be much higher in toxæmia of pregnancy cases as compared

TABLE III
Mucoprotein Content in Toxaemia With Pregnancy Cases

Group	28-32 weeks				33-36 weeks				37-40 weeks			
	No. of cases	Muco-protein (mg%) Mean	t	p	No. of cases	Muco-protein (mg%) Mean	t	p	No. of cases	Muco-protein (mg%) Mean	t	p
Mild Toxaemia	5	179.2 ±20.9	t ₁ (34) = 15.12	p ₁ <0.02	5	223.2 ±24.6	t ₁ (34) = 14.6	p ₁ 0.02	<10	284 ±16.7	t ₁ (34) = 12.1	p ₁ <0.01
Moderate/severe Toxaemia	5	210.5 ±21.6	t ₂ (33) = 13.6	p ₂ <0.01	10	299.2 ±22.1	t ₂ (33) = 11.1	p ₂ 0.01	<10	334.2 ±18.5	t ₂ (33) = 10.1	p ₂ <0.01
Eclampsia	2	313.3 ±13.1	t ₃ (27) = 14.7	p ₃ <0.01	11	326.5 ±21.6	t ₃ (27) = 16.1	p ₃ 0.05	< 7	331.3 ±19.7	t ₃ (27) = 6.12	p ₃ >0.01

t₁ denotes the comparison between mild and moderate/severe toxaemia cases

t₂ denotes the comparison between mild toxaemia and eclampsia cases

t₃ denotes comparison between moderate/severe toxaemia and eclampsia cases

TABLE IV
Uric Acid Content in Toxaemia of Pregnancy Cases

Group	28-32 weeks				33-36 weeks				37-40 weeks			
	No. of cases	Uric acid (mg%) Mean	t	p	No. of cases	Uric acid (mg%) Mean	t	p	No. of cases	Uric acid (mg%) Mean	t	p
Mild Toxaemia	5	6.35 ±0.6214	t ₁ (34) = 3.123	<0.05	5	7.23 ±0.5817	t ₁ (34) = 3.512	<0.02	10	8.96 ±0.5122	t ₁ (34) = 5.12	<0.05
Moderate/Severe Toxaemia	5	7.7 ±0.8101	t ₂ (33) = 5.123	<0.01	10	9.3 ±0.2971	t ₂ (33) = 4.1612	<0.01	10	9.7 ±0.5613	t ₂ (33) = 2.614	<0.01
Eclampsia	2	9.72 ±0.7913	t ₃ (27) = 4.123	<0.02	11	10.92 ±0.8412	t ₃ (27) = 5.612	<0.05	7	13.21 ±0.2137	t ₃ (27) = 3.712	<0.02

t₁ denotes comparison between mild toxaemia and moderate/severe toxaemia

t₂ denotes comparison between mild toxaemia and eclampsia cases

t₃ denotes comparison between moderate/severe toxaemia and eclampsia cases

TABLE V
Apgar Score and Mean Birth Weight of Babies in Normal and Toxaemia of Pregnancy Cases

Gestation (weeks)	No. of cases	Mean Birth Weight (kg)	Apgar		Score	Uric Acid (mg%)	Mucoprotein (mg%)
			1st minute	5th minute			
Normal	2	2.1	6	7	7	6.21 ± 0.4512	189.0 ± 12.8
	48	2.51	7	9	9	7.36 ± 0.6231	207.3 ± 13.71
Mild Toxaemia	2	2.14	6	7	7	7.31 ± 0.5817	227.3 ± 24.6
	13	2.32	7	8	8	8.96 ± 0.5122	284.0 ± 22.7
Moderate/Severe Toxaemia	5	1.95	5	6	6	9.321 ± 0.2871	301.0 ± 26.1
	14	2.21	6	7	7	9.7 ± 0.5213	334.0 ± 18.5
Eclampsia	6	1.85	0	0	0	11.12 ± 0.6711	327.1 ± 24.2
	7	2.12	0	0	0	13.32 ± 0.3816	335.1 ± 20.12

to normal pregnant subjects. Moreover rise in uric acid in toxaemia cases was consistent with the severity of the disease. William and Bargaen (1924) have also reported higher values of uric acid in toxaemia of pregnancy. Mukherjee (1970) has reported rise in uric acid content of amniotic fluid in cases of toxaemia of pregnancy. He also observed the rise to be directly proportionate to the severity of toxaemia. He attributes the rise in uric acid in these cases to the compensatory increase of uric acid excretion through foetal urine. However, it seems that greater the placental insufficiency, higher is the risk to foetus which is reflected in the form of increase in uric acid concentration in amniotic fluid.

Term babies who were born to normal mothers with normal levels of mucoprotein and uric acid were mature and had apgar score within normal limits. Though the mean birth weight and apgar score were low in the babies of toxaemia patients, the mucoprotein and uric acid content of liquor amnii were high. All the babies were still-born in cases of eclampsia. It was found that greater the increase in mucoprotein and uric acid, the poorer is the foetal prognosis.

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