

ESTIMATION OF AMNIOTIC FLUID MUCOPROTEIN IN NORMAL AND TOXAEMIA OF PREGNANCY

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SUMMARY

Amniotic fluid mucoprotein was estimated in normal pregnancy and pregnancy complicated with pre-eclampsia and eclampsia. Mucoprotein was increased in toxemia and the increase was directly proportional to the severity of toxemia. It was also correlated with foetal outcome, which was judged on the basis of Apgar score and birth weight. Increased mucoprotein level resulted in poor foetal outcome.

INTRODUCTION

Now-a-days overwhelming attention is being paid by the obstetrician to achieve an uneventful pregnancy and delivery with healthy neonate.

Amniotic fluid is a dialysate of both maternal and foetal plasma. Its protein balance varies during pregnancy more so in toxemia of pregnancy. Amniotic fluid contains moderate amount of mucoprotein besides albumin alpha globulin (Bevis, 1953). Mucoprotein and glycoprotein have the same structure chemically. The only distinction between them is amount of carbohydrate. It contains more than 4% hexosamine.

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The mucoprotein in liquor amnii has been studied by various groups of workers in different centres of the world in normal individual. But later on they realised the importance of liquor mucoprotein in various pathological condition such as toxemia of pregnancy as well as rhesus sensitized pregnancy (Heron, 1966, Sinha & Mukherjee, 1973; Dutta et al, 1977 Sarin et al, 1983). Since then the study of liquor mucoprotein in toxemia of pregnancy has been a subject of attraction for research work.

Mucoprotein might be an immunosuppressive agent. Sulfated mucoprotein physically masks the foetal transplantation antigen. It has an inhibitory effect on leucocyte activity, hence it might be necessary for survival of foetus.

The present work has been undertaken in normal pregnancy as control and toxæmia of pregnancy as study group.

MATERIAL AND METHODS

Study consists of 125 cases in which 35 cases were of normal pregnancy and rest toxæmia of pregnancy.

After taking the detailed history and clinical examination, necessary investigations were carried out. These cases were divided into 5 groups:-

Group I : Normal pregnancy (35 cases)

B.P. : 120/80 mm. of Hg. without any systemic disease

Group II : Mild preeclampsia (20 cases)

B.P. : upto 140/90 mm. of Hg. with or without mild oedema and /or albuminuria

Group III : Moderate preeclampsia (24 cases)

B.P. : upto 160/110 mm. of Hg with definite oedema and/or proteinuria

Group IV : Severe preeclampsia (21 cases)

B.P. : above 160/110 mm. of Hg with massive oedema and with or without proteinuria, but without convulsion

Group V : Eclampsia (25 cases)

In this group of patients convulsions were also present associated with pre-eclamptic features.

With aseptic precautions the amniotic fluid was collected from the cases either by amniotomy during labour or at caesarean section in a sterile bottle.

Determination of mucoprotein content of liquor amni was done according to method described by Winzier et al,

OBSERVATION AND RESULTS

Table I showing the range and mean value of total mucoprotein in content in normal and toxæmic pregnant cases. From this table it is evident that the concentration of amniotic fluid mucoprotein is higher in toxæmic cases than in normal pregnancy.

This table gives the range, mean and standard deviation of amniotic fluid mucoprotein in different grades of toxæmia of pregnancy and also normal pregnancy.

TABLE I

Mucoprotein level in normal and toxæmic pregnant cases

Group of cases	No. of Cases	Range (mg/100 ml)	Mean (mg/100 ml)	S.D.	S.E.
Normal pregnancy	35	122.0 - 396.50	185.393	53.19	8.99
Mild preeclamptic toxæmia	20	178.6 - 595.0	250.829	93.89	20.88
Moderate PET	24	195.89 - 789.718	319.43	147.51	30.11
Severe PET	21	321.86 - 720.41	453.445	129.08	28.16
Eclampsia	25	358.7 - 786.407	525.21	141.7	28.34

TABLE II

Comparison of mucoprotein level in different groups

Comparison	't'	'df'	'p'	Remarks
Group I and II	2.87	53	0.05	Significant
Group I and III	4.26	57	0.05	Significant
Group I and IV	9.06	54	0.05	Significant
Group I and V	11.42	58	0.05	Significant

The mucoprotein content of amniotic fluid of normal pregnancy was compared with that of different degree of toxæmia and its rise was found to be statistically significant. $t = 2.87$ and $p 0.05$ in group I and II (shown in Table II)

Apgar score of new born babies in normal pregnant cases was between 5-10 with the average of 9.3 In mild cases of (P.E.T.). Apgar score ranged from 5 to 9 with the average 8.95. In moderate P.E.T. Apgar score ranged from 0 to 10, but there were two

cases of stillbirth and two cases of respiratory distress syndrome. In severe P.E.T. and Eclampsia cases much more number of R.D.S. and stillbirth were detected. In severe P.E.T range of Apgar score was from 0 to 10, but stillbirth and R.D.S. was 7 in 21 cases. and in eclampsia it was 9 out of 25 cases. So rate of foetal death increases with severity of toxæmia.

Table IV showing the amniotic fluid mu-

TABLE III

Showing the mean mucoprotein value of amniotic fluid mean birth weight and mean apgar score

Type of pregnancy	Mean mucoprotein in value in mg/100 ml.	Mean birth weight in gms.	Mean Apgar Score
Normal pregnancy	185.393	3076.0	9.3
Mild preeclamptic toxæmia	250.829	2867.5	8.95
Moderate preeclamptic toxæmia	319.43	2633.8	7.7
Severe preeclamptic toxæmia	453.445	2480.95	6.2
Eclampsia	525.21	2444.0	5.6

TABLE IV

Authors and Years	Mean mucoprotein (mg/100 ml.)			
	Normal Pregnancy	Mild P.E.T.	Severe P.E.T.	Eclampsia
Sinha and Mukherjee (1973)	180	233	-	-
Dasgupta (1975)	155	150	-	-
Dutta et al (1977)	186	300	350	347
Sinha and Mathur (1986)	175.4	231.1	288.6	258.2
Rajdan and Nawani (1988)	189.64	259.11	270.20	346.0
Present series	185.393	250.829	453.445	525.21

coprotein level in normal and toxæmia of pregnancy studied by different workers. 9 included one more group moderate pre-eclamptic toxæmia in which mean mucoprotein level is 319.45 mg/100 ml, and the present series.

DISCUSSION

In present study, it was found that there was a direct relation between amniotic fluid mucoprotein level and increasing severity of toxæmia of pregnancy. Though it is apparent that there was rise in mucoprotein concentration with increasing degree of toxæmia, yet considerable overlapping in level of mucoprotein in different degree of toxæmia of pregnancy was observed.

Considering the mucoprotein level in the present series of study, the value is much higher than figures obtained by Sinha and Mukherjee(1973) but high level was also observed in clear sample of liquor amnii in pre-eclamptic and eclamptic cases than in normal pregnancy.

The raised mucoprotein content of liq-

uor amnii may be the reflection of active synthesis or sudden mobilisation of mucoprotein from placental tissue due to intrinsic changes in the wall of placental blood vessel leading to foetal hypoxia as noted by Apgar score. The rise of mucoprotein content of meconium stained liquor amnii in foetal hypoxia may be due to continuation of liquor amnii with meconium as it is rich source of mucoprotein (Sinha and Mukherjee, 1973). The presence of mucoprotein rich mucin in gastrointestinal secretion which is not digested by gastric juice makes the meconium a rich source of mucoprotein. The high mucoprotein concentration in clinically clear samples of amniotic fluid may be due to occult meconium which is not enough to stain the amniotic fluid (Sinha & Mukherjee, 1973 and Dasgupta,1975).

In some cases of moderate and severe preeclamptic toxæmia, there is satisfactory apgar score of the baby, same was also recorded in a few cases of eclampsia. This may be attributed to short duration of manifesta-

tion.

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SUMMARY

Amniotic fluid of 100 normal cases delivered at or near term is analysed for mucoprotein content. The method involves the use of a modified technique of H.C. Harter and a positive correlation is observed between the amniotic fluid mucoprotein content and the gestational age of the fetus. The method is simple and rapid and can be used for the estimation of growth retardation.

Over the years, many attempts have been made to estimate the mucoprotein content of amniotic fluid. The present study is an attempt to estimate the mucoprotein content of amniotic fluid by a simple and rapid method.

MATERIAL AND METHOD

The present study is based on the analysis of 100 normal cases delivered at or near term. The amniotic fluid was analysed for mucoprotein content by a modified technique of H.C. Harter. A positive correlation is observed between the amniotic fluid mucoprotein content and the gestational age of the fetus.

INTRODUCTION

The amniotic fluid is a complex fluid which contains many substances. The mucoprotein content of amniotic fluid is one of the most important factors in the development of the fetus.

Physical parameters such as weight, length, and head circumference of the fetus are important factors in the assessment of fetal growth. The amniotic fluid mucoprotein content is one of the factors which influence fetal growth.

The present study is an attempt to estimate the mucoprotein content of amniotic fluid by a simple and rapid method.