

STUDY OF SERUM ALPHA-1 ANTITRYPSIN IN CASES OF INFERTILITY

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SUMMARY

In the present study serum alpha-1 antitrypsin was studied in 58 cases of infertility and 14 cases of fertile women. Mean serum alpha-antitrypsin in control group was 178-285mg% and 22 cases of infertility it was more than 285mg%. In rest 36 cases the level was not very high but they had some other clear cut cause of infertility.

INTRODUCTION

Alpha-1 antitrypsin is a glycoprotein and most potent protease inhibitor. Proteases are capable of hydrolyzing cervical mucous. Enzyme catalyzed hydrolytic reactions may actually be involved in the process of penetration of cervical mucus by sperms. (Moghissi, 1964).

Alpha-1 antitrypsin is present in blood, amniotic fluid synovial fluid, colostrum, urine, saliva and cervical mucous etc. Its level increases during pregnancy and during use of oral pills both of which are states of temporary infertility. During mid of menstrual cycle cervical mucous is most receptive to sperms and the enzyme is lowest at that period (Schumeacher and Pearl, 1968).

Steroids also reduce its level. Alpha-1 antitrypsin in cervical mucous is a reflector of

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serum level. In our study serum Alpha-1 antitrypsin level has been studied in cases of infertility.

MATERIAL AND METHOD

58 Infertile females attending the outpatient Department of Obst and Gynae. Nehru Chikitsalya B.R.D. Medical College Gorakhpur were included in the study. Out of which 48 were of primary infertility and 10 were of secondary infertility. Besides them 14 healthy fertile females worked as controls.

Detailed history clinical examinations along with routine investigations were done. The following specific investigations were also done.

1. Semen analysis of husband.
2. Premenstrual endometrial biopsy.
3. Hysterosalpingography for tubal patency.

5 cc venous blood was collected from these patients and serum was separated. Serum alpha-1 antitrypsin was estimated by single radial-immunodiffusion method on the plate (Plates Behring werke, Germany) which contain non specific antiserum against alpha-1 antitrypsin in agar gel layer. When antigen is placed in a well of agar plate containing antibody, after 48 hrs a precipitate ring is formed Diameter of the ring (Fig.I) is directly related to concentration of testing antigen. Diameter of the ring is read with the help of microviewer and readings are calculated by reference table.

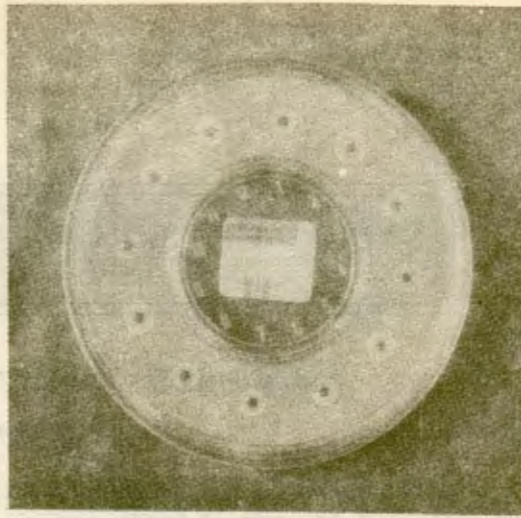


Fig.I:

Showing different diameter of the rings in study group of 12 cases on alpha-1 antitrypsin plate.

TABLE I
Analysis of levels of serum alpha-1 antitrypsin in control and study group

	Control Group No. 14	Study Group No. 58
Mean	235.2 mg%	288.27 mg%
Range	178-285 mg%	212-381 mg%
	+34.89	+51.29

In the present study 22 patients of infertility were having higher levels of alpha-1 antitrypsin, out of which 17 patients were having scanty and thick mid cycle cervical mucous. So the higher levels of alpha-1

Antitrypsin have some association with the chemical changes of cervical mucous and so indirectly to penetrability of sperms.

It appears that elevated levels of Alpha-1 antitrypsin in cases of infertility inhibits trypsin which is essential for degradation of cervical mucous and so in these cases cervical mucous remains thick and becomes hostile for sperm penetration.

Rest 36 cases of infertility had clear cut cause of infertility. Few had defects in their husbands. Others had either dysovulatory

TABLE II

Distribution of cases on the basis of Alpha-1 antitrypsin levels

	Normal		Elevated		Deficient	
	No.	%	No.	%	No.	%
Control Group No. 14	13	92.85	-	-	1	7.14
Primary No. 48	30	62.50	18	37.50	-	-
Secondary No. 10	6	60.00	4	40.00	-	-

infertility or tubal blockage. According to the work done by Gupta et al, 1987. The level of serum alpha-1 antitrypsin in sterility varied from 216 to 340mg% with a mean of 287.4+42mg% and 32% infertility cases had level of serum alpha-1 antitrypsin greater than 240mg%.

Due to raised level of antiproteases proteolytic activity is inhibited and thus hydrolytic digestion of cervical mucous by trypsin does not take place. So sperms are unable to penetrate and thus conception does not occur leading to infertility. It may therefore be concluded that alpha-1 antitrypsin level estimation may be very useful in the management of unexplained infertility.

1. Mean serum alpha-1 antitrypsin level in control group was 178 to 285mg%.

2. Mean serum alpha-1 antitrypsin level in study group was 212-381mg%.
3. In 22 cases of infertility alpha-1 antitrypsin was more than 285mg%, which was highest level found in control group.
4. In rest 36 cases of infertility serum alpha-1 antitrypsin was not very high but they had some other abnormalities.

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