

STUDY OF SERUM ALPHA-1-ANTITRYPSIN IN CASES OF STERILITY

By

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SUMMARY

A study of 100 sterility cases and 25 control cases was conducted to estimate the serum alpha-1-antitrypsin and to find out its role in etiopathogenesis of sterility. Alpha-1-antitrypsin was found in high levels of 216-340 mg% with a mean 287.4 ± 42.7 mg% in sterility cases and this was significant in comparison to control cases. Thus it seems that high levels of alpha-1-antitrypsin being an antiprotease interferes in cervical mucous physiology and may lead to infertility in females.

Introduction

Proteolytic enzymes trypsin and chymotrypsin, readily hydrolyse the mucoid of cervical mucous (Moghissi, 1964) on account of which cervical mucous network degrades due to hydrolytic digestion (Kremer, 1968) resulting in decreased viscosity, loss of spinnbarkeit and alteration in electro-phoretic mobility, which may be helpful in the sperm penetration. These hydrolytic enzymes play an important role in early stages of ovum development and in sustaining the fertilized ovum (Garcia and Bunnell, 1966). Presence of antiproteases like alpha-1-antitrypsin in cervical mucous (Schumacher, 1968) which inhibit the trypsin and similar proteolytic enzymes and thus alter the cervical mucous physiology (Robert and Valdevajan, 1971) provided incentive to this logical study.

Material and Methods

The study was carried out in 100 cases of sterility and 25 normal healthy controls who had not been given typhoid vaccine, oral pills and steroids; who had not suffered from jaundice, infections and other chronic diseases during last 6 months. Estimation of serum alpha-1-antitrypsin was carried out by single radial immunodiffusion technique on M-partigen immuno-diffusion plates (Behringwerke-Germany) containing non-specific antiserum against alpha-1-antitrypsin in an agar-gel layer. Antigen (5 μ l) is allowed to diffuse from a central plate into agar containing antibody and kept for 48 hours, then diameter of precipitate ring read with microviewer, under standard condition which remains proportional to the concentration of testing antigen (Mancini, 1965). A reference curve is prepared and alpha-1-antitrypsin estimated with the help of calibrated standard graph (Fig. 1).

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Discussion

Present study concludes that alpha-1-antitrypsin levels 216-340 mg% with a mean 287.4 ± 42.7 mg% in sterility cases was significant ($P < 0.01$) as compared to control group and levels were higher in cases of primary sterility as compared to secondary sterility was also statistically significant ($P < 0.05$). Out of 100 cases 32 (27 of primary and 5 of secondary sterility) cases were having high levels of alpha-1-antitrypsin (more than 240 mg%). Lieberman (1973) described serum alpha-1-antitrypsin 200 mg% as normal level, 60-190 mg% in intermediate deficiency (Heterozygous) and below 60 mg% in homozygous deficiency state. During pregnancy and with use of oral pills (physiological temporary sterility) increased levels of serum alpha-1-antitrypsin have been reported by Beller and Weiss, (1966). Surprisingly enough our

Results

Tables I and II show the results.

TABLE I

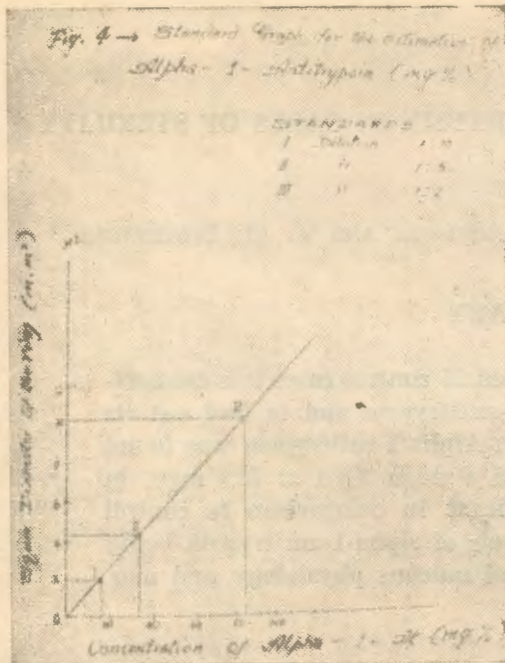
Showing Serum Alpha-1-Antitrypsin in Controls, Primary and Secondary Sterility Cases

	Controls	Primary Sterility	Secondary Sterility	Sterility cases (Primary + secondary)
n	25	84	16	100
Serum alpha-1-anti-trypsin in mg%				
Mean	242.7	298.0	271.0	287.4
S.D.	± 37.5	± 56.3	± 32.0	216-340
Significance	$P < 0.01$	$P < 0.05$	$P < 0.05$	$P < 0.01$

TABLE II

Showing Number of Cases Having Alpha-1-Antitrypsin Levels Within Normal Range, Below or Above it

Groups	Number of cases					
	Normal		Below normal		Elevated	
	No.	%	No.	%	No.	%
Control cases n = 25	23	92.0	1	4.0	1	4.0
Primary Sterility cases n = 84	57	67.85	0	—	27	32.0
Secondary Sterility cases n = 16	11	68.75	0	—	5	31.25



report also showed that significant number (32%) of sterility cases were having high levels of serum alpha-1-antitrypsin. Steroids reduce the serum trypsin inhibitors (Faarvang and Lauritsen, 1963) and may be helpful in increasing the proteolytic activity and therefore helpful in transportation of sperms. It may therefore be concluded that alpha-1-antitrypsin estimation may be a very useful in the management of unexplained sterility.

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