MAGNESIUM CONCENTRATION IN HUMAN SEMINAL PLASMA IN INFERTILE COUPLE

by

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Introduction

For better assessment of role of Seminal Plasma it is necessary that apart from semen analysis, biochemical parameter should also be taken into consideration.

Seminal plasma consist of inorganic substances. Ca++, Mg++ and Zn++ cations are present in high concentration in male reproductive tract (Eliasson *et al*, 1970; Mann, 1964). Experimental study have shown Mg++ as an important heavy metal which inhibits steroid metabolising enzyme (Touhimma and Niemi, 1970, 1971, 1974).

Present work is one of the few clinical studies done in relation to magnesium in infertile couple.

Material and Methods

Specimen of seminal fluid were collected from

(A) men who were married and had children (fertile group) they acted as control.

(B) men whose wives had not conceived after 2 years of married life with no contraceptive practice (Infertile group). Table I shows the description of subjects studied.

TABLE I
Description of Subjects

Group Type	No. of Subjects	Mean Age (Years) t	Range (Years) t
Fertile	3	30.5	25-34
Infertile*	24	31.5	
Normal	—1.0	32.5	25-44
Doubtful	—5	27.3	25-32
Pathological	—9	31	25-35

* Eliasson (1975) criteria for evaluation of semen.

History of heriditary, systemic, viral or venercal disease was sought. General examination was done with particular emphasis on health, development of secondary sex character, congenital anomalies.

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Accepted for publication on 15-2-82.

Local examination was done to find out any cause of sterility eg. epispadius, hypospadias, hydrocele, varicocele, infection (orchitis, epidydimits) and surgical operation.

Specimen was taken usually after 48-72 hours abstinence. In most cases specimen was collected by masturbation in clean petridish and submitted for analysis immediately. The cases were grouped according to criteria laid down by Eliasson's (1975) into 3 group—normal, doubtful and pathological. Magnesium level was estimated by Perkin Elmer atomic absorption spectrophotometry model 303.

Results of present study are shown in Table II.

tern and capacity of various parts of prostate can vary (Gyorkey *et al*, 1967), hence there can be wide range of value as observed in present study and that of Eliasson (1970) and Homonnai *et al* (1978).

In 44.40% of pathological, 40% of doubtful group less than 80 ug Mg/ml was found, while in no case of "normal" specimen it was below 80 ug Mg/ml (Table II). No such correlation was observed on statistical evaluation perhaps due to lesser number of subjects studied. Eliasson (1970) found 75% with pathological seminogram had magnesium concentration below 50 ug/ml, while 40% among those with more than 100 ug/ml

TABLE II

Magnesium Value in Seminal Plasma of Fertile and Infertile Couple

Group Type	No. of Subjects	Mean Mg ++ ug/ml	SD	Range	"t"
Fertile (Control)	3	112	0		
Infertile*	24	—	—		
1. Normal	10	135.8	37.99	96-192	1.98
2. Doubtful	5	139.2	65.87	80-224	0.10
3. Pathological	9	108	39.19	64-176	0.30

Student (t) test applied and P value calculated.

Discussion

High concentration of cation Ca++, Mg++ and Zn++ have been reported for the human testis, prostate, and seminal vesicle (Quinn *et al*, 1965). According to Eliasson (1970) magnesium mainly originates from prostate. The mean value for seminal plasma (SP) magnesium in fertile group was 112 ug/ml (SD-O) and that in the 3-infertile grorup, viz. normal, doubtful and pathological was 135.8 (SD ± 37.99 range, 96-192), 139.2 (SD ± 65.87 range, 80-224), 108 (SD ± 39.19, range 64-176) respectively. Since secretory pat-

and in no case with 'Normal' specimen it was below 50 ug/ml. Homonnai *et al* (1978) found an inverse correlation with three cation Ca++, Zn++, Mg+. The secretory activity of prostate in general is known to be closely controlled by androgen. Experimental studies of Henriche and Dirscherl (1969) and that of Tuohimma and Niemi (1970), Niemi and Tuohimma (1971) have shown Mg++ as an important heavy metal inhibiting steroid metabolising enzyme affecting the conversion of testosterone to dihydrotestosterone to 5 androstan 3-17-diol. The metabolism in decreasing order of rapi-

dity ie-epididymis-prostate (all lobes)-seminal vesicle.

Wales and While (1958) in their experimental study showed that the secretory product of accessory gland (alkali metal Mg++, Ca++) can affect the spematozoa mobility in ejaculate. Magnesium concentration can therefore yield much information to androgene status and secretory function of male accessory glands, and can be utilized as biochemical parameter in various andrology laboratory.

Summary

In the present study, 27 specimens of human seminal plasma have been analysed for Magnesium by atomic absorption spectrometry. The concentration of Magnesium was corelated with semen quality, as judged by motility, vitality, concentration and morphology of spermatozoa. We found no significant relationship between concentration of Magnesium and semen quality. But in no case of "normal" specimen it was below 80 ugMg/ml. The range of Magnesium concentration in seminal plasma was 80-224 ug/ml.

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