

A STUDY OF SERUM MAGNESIUM IN DIFFERENT TYPE OF ABORTIONS

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SUMMARY

Magnesium is the fourth most abundant cation in man. It is important in maintaining the normal function in cells (Tissiers *et al*, 1959). Low levels of serum magnesium has been observed during pregnancy and further lowering levels were seen in abortions. It's role in enzymatic activity of cells to release energy is well established (Wacker, 1969) but its role in etiopathogenesis of abortion is obscure.

The present study was undertaken with the aim to find out serum magnesium levels in various type of abortions which may provide an insight and future ray of hope for better understanding of biochemical alteration responsible for causation of abortions and effective management.

Introduction

Magnesium is important in maintaining the normal function of cells. In present study, serum magnesium was studied in 60 women of various type of abortions. Twenty non-pregnant normal women, and 20 normal pregnant women were included as control. Serum magnesium study was done using method of Tital yellow (Henery *et al* 1974). In normal pregnancy, serum magnesium was lower than non-pregnant group (2.08 ± 0.16 to 2.25 ± 0.12). But in cases of various types of abortion further lower levels were seen (1.85 ± 0.23 in abortion to $2.08 \pm$ mg% in normal pregnancy). Low level

of magnesium is causative factor of abortion or its result is not clear.

Material and Methods

The study was undertaken in 100 women attending Associated Group of Hospitals, S.P. Medical College, Bikaner. They were studied in following groups;

Group No.	Type	No. of cases
1	Normal non-pregnant control	20
2	Normal pregnant control	20
3	Threatened abortion	20
4	Incomplete abortion	20
5	Missed abortion	10
6	Habitual abortions	10

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In Group No. 1, 20 non-pregnant healthy females of reproductive age group, were nurses, patient's attendants. In Group No. 2, cases from family planning clinic were taken who came for termination of pregnancy upto 20 weeks.

In all cases, detailed history and clinical examination were done. Blood for Hb% and urine for albumin and sugar and microscopic, VDRL, blood grouping, was done in all cases of abortions. Gravindex test was done in few cases of threatend, missed and habitual varities.

Care was taken not to administer any magnesium containing compound prior to the estimation.

2 ml of venous blood was taken in glass tube with autoclaved syringe. Blood was allowed to clot. Then test tube was rotated between palms for 2 to 3 times and clot separated. Then the test tube was placed in incubator at 37°C in standing position for half an hour. Tube was centrifuged and serum was separated. Haemolysed blood samples were discarded.

Two ml of blood was again taken on follow-up after 7 days in all cases of abortion.

Serum magnesium estimation was done using Tital yellow as described by Henery *et al* (1974).

Observations and Discussion

In this study, serum magnesium level for normal non-pregnant women was 2.2 ± 0.12 mg% which is in accordance with workers used tital yellow for staining (Ray *et al*, 1979). Diversity of serum magnesium level recorded for normal pregnancy ranged from 1.8 to 2.26 mg% with mean 2.08 ± 0.16 mg% (Table 1). Similar fall was observed by various workers (Dawson *et al*, 1969; Rizivi *et al*, 1979). This fall is due to hypervolemia of pregnancy (Lim *et al*, 1969). A further decrease in serum magnesium level as pregnancy advances may be due to increased demand by growing fetus (Lim *et al*, 1969). Rizivi *et al* (1979) attributed it due to increased urinary loss of magnesium ions to conserve calcium ions. Dawson *et al* (1969) found increased demand of copper replaces the magnesium ions from blood so as to cause a decline in serum magnesium level.

In present study, no significant correlation could be observed between age, parity and serum magnesium level.

The mean serum magnesium level in all type of abortions when taken together was lower than that of normal pregnancy group (1.85 ± 0.23 , to 2.08 ± 0.16 mg) which is in accordance with Dumont (1965), Dumont and singh (1979).

TABLE I
Serum Magnesium Levels in Various Groups

Groups	No. of cases	Mean serum magnesium in mg% \pm SD	Range	p
Non-pregnant	20	2.25 ± 0.12	1.98-2.48	
Normal pregnancy	20	2.08 ± 0.16	1.82-2.26	.001
Abortion group	60	1.85 ± 0.13	1.34-2.43	0.001
Threatened abortion	20	1.87 ± 0.13	1.52-2.38	0.001
Incomplete abortion	20	1.69 ± 0.19	1.34-2.08	0.001
Habitual	10	2.02 ± 0.30	1.48-2.43	.001
Missed	10	1.94 ± 0.17	1.56-2.24	.05

In the present series, out of 60 abortions cases, 19 (31.66%) were having serum magnesium level below 1.6 mg%. Out of these, 7 were of threatened abortions, 9 were of incomplete abortions and 1 of habitual abortion and 2 of missed abortion group. Our findings are coinciding with Dumont's series of 65 cases (1965).

Out of 20 cases of threatened abortion group, 8 aborted. The follow-up study (done after 7 days) revealed (Table II)

on cell energy, deficiency may result in blighted ova. In animal studies it was seen that increase in calcium and decrease in magnesium results in uterine contraction (Kochmon, 1921), oxytocic effects of ergot and histamine were depressed by increase in Mg ions (Frazer, 1939) when animals were fed by keeping them in low magnesium diet. This resulted in low fertility abortion and malformed/IUGR babies (Cosla, 1950 and Hurley, 1976).

TABLE II
Serum Magnesium Level in Follow-up of Cases After 7 Days

Type	No. of cases	Mean serum magnesium level \pm S.D.			
		1st reading at time of	II reading after 1 days	Differences	p
Threatened abortion group	8	1.82 = 0.13	2.03 \pm 0.17	0.21	.3
Preg. Cont.	12	1.90 = 0.12	1.97 \pm 0.15	0.07	0.7
Incomplete	20	1.69 \pm 0.19	2.13 \pm .12	0.44	.001
Habitual	10	2.02 \pm 0.30	1.94 \pm 0.26	0.08	.05
Missed	10	1.94 \pm 0.17	1.97 \pm 0.16	0.03	0.8

rise in serum magnesium level in aborted group. It is due to re-adaptation of maternal circulatory system by haemo-concentration to non-pregnant state. Similar observations were made in other groups of abortions in follow-up study. Dumont (1965) observed that in all the state of uterine hyperexcitability (during labour of abortion) there is decrease in serum magnesium levels, while Rasu *et al* (1966) found lower values in premature labour than mature labour.

In present study, low levels of serum magnesium was observed, how it plays a rôle in etiopathogenesis of abortion is not very clear. Whether low magnesium level is the causative factor of abortion or its result, is not clear. It can be hypothesized that as magnesium acts

Correlating our findings and animal studies on magnesium ion it can be stated that in future therapeutic trial of magnesium ions will be helpful in case of abortion and premature labours.

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SUMMARY

Comparative studies of serum magnesium levels in different types of abortions were conducted. The results showed that the magnesium levels were significantly lower in the cases of spontaneous abortions compared to the cases of induced abortions. The study also revealed that the magnesium levels were lower in the cases of incomplete abortions compared to the cases of complete abortions. The findings of this study suggest that the magnesium levels in the serum may be a useful indicator of the type of abortion. Further studies are required to confirm these findings.

The present study was conducted to determine the serum magnesium levels in different types of abortions. The study was conducted in a tertiary care hospital. The subjects included women who had undergone spontaneous abortions, induced abortions, complete abortions, and incomplete abortions. The serum magnesium levels were measured using a colorimetric method. The results showed that the magnesium levels were significantly lower in the cases of spontaneous abortions compared to the cases of induced abortions. The study also revealed that the magnesium levels were lower in the cases of incomplete abortions compared to the cases of complete abortions. The findings of this study suggest that the magnesium levels in the serum may be a useful indicator of the type of abortion. Further studies are required to confirm these findings.