

# SERUM MAGNESIUM LEVEL IN PREGNANCY

By

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## SUMMARY

Serum magnesium levels in normal and toxæmic pregnancy were studied. The serum magnesium level was less during pregnancy specially during third trimester. In toxæmia of pregnancy it was reduced markedly as compared to normal pregnancy. Values below 1.21 mg/100 ml. are associated with convulsions.

### Introduction

Magnesium levels in normal pregnancy were first described by Plass and Bogert (1923), who found a decrease in the later part of pregnancy. Hall (1957), Olatunbosum *et al* (1957) and Rizvi *et al* (1979) also found a decreasing trend in serum magnesium levels.

### Material and Methods

Estimation of serum magnesium levels both in random and serial (10 cases) studies were carried out in 126 pregnant women by using Klett Summerson photoelectric colorimeter. Twenty-five non-pregnant women in the reproductive age group comprised the control group. Serum magnesium level was estimated in some cases in the pre-ovulatory phase and in some cases in the post ovulatory phase.

### Observations

Mean serum magnesium levels decreased as pregnancy advanced with the low-

est levels being observed in the 3rd trimester. After the delivery, the mean level increased again to the normal pre-pregnancy level (Table I).

TABLE I  
*Serum Magnesium Level in Normal Patients*

Group	No. of estimations	Serum Mg. Mean $\pm$ S.D.
Non-Preg.		
Pre-ovulatory	25	2.52 $\pm$ 0.28
Non-Preg.		
Ovulatory	25	2.41 $\pm$ 0.29
1st Trimester	30	2.57 $\pm$ 0.29
2nd Trimester	68	2.10 $\pm$ 0.17
3rd Trimester	73	1.84 $\pm$ 0.16
Post Partum	18	2.69 $\pm$ 0.32

No difference in the mean serum magnesium level was seen in the random and serial groups (Table II).

TABLE II  
*Mean Serum Magnesium Level in Normal Pregnancy*  
(Random and Serial group)

Group	1st Trim.	2nd Trim.	3rd Trim.
Serial group	2.56	2.12	1.77
Random group	2.57	2.10	1.84

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Mean serum magnesium level in the 3rd trimester of pregnancy in diabetic patients was slightly higher than the corresponding values in normal pregnancy but the difference was not significant (Table III).

TABLE III  
Serum Magnesium Level in Diabetic Pregnant Women

Group	No. of estimation	Serum Mg. in mg/100 ml.
Non-diabetic	73	1.84 ± 0.16
Diabetic	4	2.05 ± 0.11

The mean serum magnesium level in 3 cases of twin pregnancy in the 3rd trimester was 1.955 ± 0.15 mg/100 ml. This was similar to the levels seen in the 3rd trimester of normal pregnancy.

Mean serum magnesium levels in toxæmia of pregnancy was much lower as compared to the normal levels in uncomplicated pregnancy (Table IV).

#### Discussion

Serum magnesium levels show a gradual decline during pregnancy specially marked during the later part of pregnancy. A similar pattern has been observed in normal pregnancy both in the random as well as in the group with serial estimations. Similar findings have been

recorded by earlier workers (Plass and Bogert, 1923; Hall, 1957; Dale and Simpson, 1972; Olatunbosum *et al*, 1975 and Rizvi *et al*, 1979).

Plass and Bogert (1923) think that it is due to (i) depletion of maternal resources due to fetal demand (ii) a higher concentration in the fetal tissues thus ensuring a continuous supply from the maternal tissues (iii) improper digestion and (iv) haemodilution.

In toxæmia of pregnancy, the corresponding levels in 3rd trimester were lower as also observed by Pradhan *et al* (1964) and Rizvi *et al* (1979). The only difference was a level below 1.21 mg/100 ml. when all the cases were associated with convulsions. So a level below 1.21 mg/100 ml may be critical level for onset of convulsions as also observed by Martin *et al* (1958).

The serum magnesium levels in controlled diabetics in 3rd trimester is similar to levels in normal pregnancy as also observed by Wacker and Vallee (1958).

#### Conclusion

(i) Serum magnesium levels in non pregnant women show no difference in the pre- and post-ovulatory phase.

(ii) Serum magnesium levels show a decreasing trend during pregnancy specially in the last trimester.

TABLE IV  
Serum Magnesium Level in Toxaemia of pregnancy

Period of Gestation	Normal Pregnancy		Toxaemia Pregnancy		t	p
	No. of cases	Mean ± S.D.	No. of cases	Mean ± S.D.		
23-24	14	2.11 ± 0.26	2	1.75 ± 0.35	0.51	>0.05
33-34	13	1.82 ± 0.22	6	1.28 ± 0.19	5.4	<0.05
35-36	18	1.77 ± 0.22	4	1.25 ± 0.10	13	<0.001
37-38	11	1.82 ± 0.15	8	1.16 ± 0.19	5.5	<0.05

(iii) Serum magnesium levels are significantly lower in toxæmia of pregnancy specially in the 3rd trimester.

(iv) Serum magnesium levels below 1.21 mg/100 ml are critical for onset of convulsions.

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