INTRODUCTION
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Magnesium is an indispensable constituent of all living cells. It is one of the most important intracellular cation of the body. It is the fourth most important ion in intracellular fluids. It is an important cofactor of about 300 cellular enzymes in human body. In nature as a whole magnesium appears to be involved in reactions of photosynthesis, hibernation, cell adhesions and catabolism of carbohydrates, proteins and nucleoproteins (Aikawa 1963). This association of magnesium with many different biological processes has lead scientists to think that it has complex fundamental role to play.

Magnesium levels in normal pregnancy were first described by Plass & Borget (1923) who found a decrease in later part of pregnancy. Further decrease in serum magnesium levels has been observed in cases of (I) threatened abortion (II) Preterm labour & (III) Pregnancy induced hypertension.

Becher &Bomskov (1932) found levels of serum magnesium in normal pregnancy to be between 1.7-2.6mg%. Sohi set the limit to 1.0-3.0 mg%. Walker & Walker (1933) found the values of serum magnesium in normal pregnant state to be 1.6 – 3.0 mg%.
Velluz & Velluz (1934), Cope (1936) reported their mean value of 2.06-2.04mg% respectively. Andreason (1957) & Hall et al (1957) estimated their mean value of 1.87 ± 0.17mEq/l.

Goldsmith & Goldsmith (1966) found levels around 1.73 ±0.15mEq/l. Khan et al (1968) found serum magnesium in normal pregnancy to be 1.98 ± 0.36mg%.

Spontaneous abortions refer to involuntary pregnancy losses occurring before fetal viability i.e. before 24 weeks of gestation. 80% of these occur before 12 weeks & are called as early abortions. The risk of spontaneous abortions for the first time is 15% and for a repeated abortion after one previous abortion is 19% & consequently 35% (Fernando Arias). Threatened abortion is a clinical entity where the process of abortion has started but has not progressed to an extent from which recovery is impossible. Usually an explanation for the large majority of abortions is that they are mainly caused by :-

(I) Genetic abnormalities - 50%

(II) Endocrine abnormalities - 10-15%

(III) Chorioamniotic separation - 5-10%

(IV) Incompetent cervix - 8-15%

(V) Infections - 3-5%
(VI) Uterine abnormalities, Immunologic abnormalities & miscellaneous

This miscellaneous group is under study with a very small percentage being related with serum magnesium deficiency.

Preterm labour is defined as the onset of labour in patients with intact membranes before 37 weeks of gestation. Its prevalence varies between 5-10%. It is diagnosed if patients presents with painful uterine contractions at least once in 10 min and lasting for 30 seconds or more with progressive dilatation & effacement of the cervix. It is seen in association with preclampsia, APH, polyhydramnios, uterine & cervical anomalies, medical & surgical illness & genital tract infections. On investigations serum magnesium levels in these patients is also found to be lower. Khan et al (1966) found lowered values of serum magnesium in preterm cases nearing 1.17mg%.

Pregnancy induced hypertension develops as a direct result of the gravid state of uterus when there is no antecedent history of hypertension prior to pregnancy. Preeclampsia is a multisystem disorder of unknown etiology characterized by development of hypertension to the extent of >140/90mm of Hg with edema or proteinuria or both after the 20th week of pregnancy. While in normal pregnancy blood vessels become refractory selectively to presser agent angiotensin (II) due to PGI2, nitric oxide and
serum magnesium levels are said to have a role in this mechanism. Kister et al found levels of serum magnesium in PIH to be around 1.01 ±0.16 mg% which were much lower than the values in normal pregnant states.

Various theories have been proposed regarding the mode of action of magnesium on pregnant women. Magnesium contributes for stabilization of highly ordered organization of macromolecule of DNA, RNA and ribosomes. Genetic information stored in DNA is transcribed into messenger RNA which in turn translates that information into amino acid sequences in the newly synthesized proteins.

The physical integrity of DNA helical appears to depend upon magnesium. The physical size of RNA aggregate is controlled by the concentration of magnesium and polypeptide formation cannot proceed unless magnesium concentration is optimal. All these functions depend upon the ability of magnesium ions to from chelates. The magnesium competes with calcium within cell for calmodulin activation. During contraction calcium binds to calmodulin and resulting complexes activates myosin light chain complexes.

This is primarily due to influx of calcium from extracellular fluid via voltage gated channels, for magnesium acts at this site. All these functions
particularly its role as an activator in biochemical system, pharmacological properties and functions as essential nutrient for human body have been submitted to extensive investigations.

Such rapid and significant advances in understanding of the mechanism of action of magnesium depends upon the ability of magnesium ion to form chelates. The fundamental role of magnesium in all biological processes therefore seems to be that of chelating agent.

Magnesium has important effect on central nervous system and neuromuscular transmission. It is a depressant of central nervous system and low magnesium levels may evoke increased irritability, confusion and convulsions. The central nervous system and the myoneural depression produced by magnesium can be antagonised by calcium activation which bring about uterine contractions.

Plasma concentration of magnesium is normally maintained within very narrow limits, it being predominantly an intracellular ion. The laboratory detection of clinical magnesium deficiency is very difficult because the magnesium levels often differ slightly from normal even in presence of clinically demonstrable deficiency.

Since there are multiple factors that influence the absorption and excretion of magnesium as well as the amount needed for metabolic
processes, it is not surprising that there is disparity as to what is the exact magnesium requirement during pregnancy. Increased intake and metabolism of calcium, phosphates, vit. D and proteins each increase the magnesium requirement.

The knowledge of precise role of serum magnesium in human physiology is surprisingly limited. Biological functions of metabolism of this ion have stemmed largely from the discovery of fluorophotometer and spectrophotometer which provide a simple and precise method for the analysis, thereby revolutionizing the field. Unfortunately the analytical chemistry of magnesium has not revealed similarly advanced stages. Technical handicap unquestioningly accounted for the paucity of the knowledge of this metabolite in its role in various pathological states.

There is enough information available in literature that changes in levels in serum occurs in pregnancy so this study was undertaken to evaluate the comparative values of serum magnesium levels in the normal and abnormal cases like that of threatened abortion, preterm labour and pregnancy induced hypertension followed by role of its supplementation.