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FREQUENCY OF HYPOMAGNESAEMIA IN PRE TERM LABOUR

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Abstract

Objective: To determine the frequency of hypomagnesaemia in women with preterm labour. **Study Design:** Cross sectional study **Settings**: This study was carried out in department of obstetrics & gynaecology Nishtar Hospital Multan. Duration of study: This study was conducted from 10th November 2016 to 10th May 2017. **Subject and methods**: A total of 219 pregnant women with singleton pregnancy, preterm labour and parity 1 – 4 were included in the study. Women with history of diabetes, hypertension smoking and polyhhydramnious amniotic fluid index (AFI)>25 cm on ultrasound were excluded. Venous blood was drawn from entire subjects to evaluate the serum magnesium level and sent immediately to laboratory for analysis venous blood samples were obtained by venipuncture and collected in lithium heparin specimen bottles. Data was collected for hypomagnesaemia. **Results**: age range in this study was from 20 to 40 years with mean age of 30.356±3.60 years, mean parity 1.936± 0.96, mean gravida 2.936 ± 0.96, mean gestational age 32.000±2.25 weeks and mean BMI was 27.337 ± 1.67 kg/m^2. Majority of the patients were from 20 – 30 years (51.1%). History of preterm delivery was 17.4%. Majority of patients belong to middle economic status (66.2%). Hypomagnesaemia was seen in 37.9% patients. **Conclusion**: it is concluded that low serum magnesium (hypomagnesaemia) is associated with preterm onset of labour. Maternal hypomagnesaemia may be used as a predictor of preterm labour:

Key words: Pregnancy, preterm labour, hypomagnesaemia

Introduction:

Preterm labour is the onset of labour before 37 completed weeks of gestation[1]. One of the important causes of preterm delivery is the occurrence of spontaneous preterm labour [2,3]. Although having varied etiology preterm labour may be due to changes in various biochemical functions starting at cellular level, signifying value of trace elements, specially magnesium. Magnesium plays a vital role in cellular function[4]. Magnesium level in the serum range from 1.5 to 2.1 mg/dl [4]. It is well established that serum magnesium levels fall throughout pregnancy. This falling level of magnesium plays a vital role in the onset of labour. This decreased level of magnesium causes reduced magnesium level in myometrium causing initiation of labour [5]. The uterine relaxation effect caused by magnesium is because of the antagonism effect on calcium provoked uterine excitability.[6] Hypomagnesaemia causes cervix to dilate facilitating passage of various microorganisms into cervix and finally uterus [7].

In a study conducted by Kehinde S showed that hypomagnesaemia was seen in 47% women presenting with preterm labour [8]. Uptil now no study has been conducted in our population on role of magnesium in preterm labour. This study is conducted to reduce morbidity and mortality resulting from prematurity associated with hypomagnesaemia.

MATERIAL AND METHODS:

It was a cross sectional study conducted from 10th November 2016 to 10th May 2017 at obstetrics and Gynaecology department Nishtar Hospital Multan. Non-probability consecutive sampling technique was used. 219 women 20-40 years old having preterm labour and singleton pregnancy on ultrasound were included in the study after permission from ethical committee and research department. Women having history of diabetes,

hypertension, cigarette smoking and polyhydramnios (amniotic fluid index AFI>25cm on ultrasound) were excluded from the study. Baseline demographic data of patients was collected. Informed consent was given by every patient venous blood sample was taken from each patient to determine serum magnesium level and was sent for analysis to laboratory immediately.

These samples were collected by a third year resident trainee in lithium heparin specimen bottles after obtaining by venipuncture. Data regarding hypomagnesemia was collected and recorded on the proforma which was especially designed.

Results:

Age range in this study was from 20 to 40 years with mean age of 30.356±3.60 years, mean parity 1.936±0.96, mean gravida 2.936± 0.96, mean gestational age 32.000 ± 2.25 weeks and mean BMI was 27.337±1.67 kg/m^2 as shown in table – I. Majority of the patients were from 20 – 30 years (51.1%) as shown in table – II. History of preterm delivery was 17.4% as shown in table III. Hypomagnesaemia was seen in 37.9% patients as shown in table IV. Stratification of hypomagnesaemia with respect to age, parity and history of preterm delivery are shown in table V, VI, VII respectively.

Table-I: Mean ± SD of age, parity, gravida, gestational age and BMI n=219

Demographics		Mean ± SD
1	**Age (years)**	30.356±3.60
2	**Parity**	1.936±0.96
3	**Gravida**	2.936±0.96
4	**Gestational Age (weeks)**	32.000±2.25
5	**BMI(Kg/m^2)**	27.337±1.67

Table- II: Frequency and percentage of patients according to age n=219

Age Groups (years)	No of Patients	%age
20-30	112	51.1%
31-40	107	48.9%

Table- III: Frequency and percentage of patients according to history of preterm delivery n=219

Preterm Delivery	No of Patients	%age
Yes	38	17.4%
No	181	82.6%

Table- IV: Frequency and percentage of patients according to Hypomagnesemia n=219

Hypomagnesemia	No of Patients	%age
Yes	83	37.9%
No	136	62.1%

Table- V: Stratification of Hypomagnesemia with respect to age groups

	Hypomagnesemia		
Age Groups(years)	**Yes**	**No**	**P value**
20-30	39(34.8%)	73(65.2%)	0.337
31-40	44(41.1%)	63(58.9%)	
Total	83(37.9%)	136(62.1%)	

Table- VI: Stratification of Hypomagnesemia with respect to parity

	Hypomagnesemia		
Parity	**Yes**	**No**	**P value**
1-2	60(37.5%)	100(62.5%)	0.841
3-4	23(39%)	36(61%)	
Total	83(37.9%)	136(62.1%)	

Table- VII: Stratification of Hypomagnesemia with respect to history of preterm delivery

	Hypomagnesemia		
History of preterm delivery	**Yes**	**No**	**P value**
Yes	26(68.4%)	12(31.6%)	0.000
No	57(31.5%)	124(68.5%)	
Total	83(37.9%)	136(62.1%)	

DISCUSSION:

Multiple studies have been conducted to determine relationship between preterm labour and low maternal serum magnesium levels. But no such study is carried out in Pakistan to establish this association between low serum magnesium levels and preterm labour.

In our study, hypomagnesaemia was present in 37.9% patients. Our study results match with results of study conducted by Kehinde S and her colleagues. In their study hypomagnesaemia was seen in 47% of patients presenting with preterm labour.[9]

In a study conducted at Bangladesh by Shahid AR and her colleagues frequency of hypomagnesaemia was 60% in 10 women presenting with preterm labour.

Incidence of hypomagnesaemia slightly less than 46% is seen in same number of patients in a study conducted by Shahid et at [10].

This discrepancy may be because of difference in cut off points for magnesium (1.5 versus 1.9 mg/dl, respectively) in the two different studies.

Main emphasis of our study is the role of level of serum magnesium in precipitating preterm labour.

Previous reports and studies have documented a reduced level of serum magnesium in patients presenting with preterm labour [11 – 14]. Study conducted by Pushpa and Jagdish, showed that in patients presenting with preterm labour serum magnesium level was low [15]. A study conducted by Begum et al also documented that in women presenting with preterm labour there was a marked reduction in serum magnesium level (mean 1.77±0.36).

There are other studies and systemic reviews that failed to establish relationship between preterm labour and low serum magnesium levels. [15 – 17]. These studies suggested that use of magnesium whether oral or parenteral had no beneficial effect to delay preterm labour or prevent the occurrence of premature birth[15,18,20] and so it can't be routinely used as a tocolytic agent [20]. But several studies revealed reduced serum magnesium levels in patients presenting with preterm labour showing that hypomagnesaemia is an important risk factor for causing preterm labour.

CONCLUSION:

Hypomagnesaemia is a contributing factor for preterm labour. So, low maternal serum magnesium levels may be utilized for prediction of preterm labour.

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