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A PROPORTIONAL ANALYSIS OF EFFECTIVENESS FOR TOCOLYSIS OF PRETERM LABOUR BETWEEN NIFEDIPINE AND MAGNESIUM SULPHATE

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Abstract:

Objective: *The objective of this evaluation and research was to weigh up the effectiveness of nifedipine and magnesium sulphate for tocolysis of preterm labour.*

Materials & Methods: *We concluded this proportional research in the period of November 2017 to December 2018 at Mayo Hospital, Lahore on 182 patients. These patients were categorized as preterm labour patients. The age bracket of the patients was from 16 years to 35 years. LMP evaluated gestational age was (28 – 36) weeks with a singleton pregnancy. We did not include any patients under the age of 16 years and above the age of 35 years along with those patients who presented history of pre-eclampsia, diabetes mellitus, hepatics function, cardiac disease, severe IUGR, membranes rupture, ante partum hemorrhage, fetal distress, cervix (>4cm) dilated, chorioamnionitis, congenital fetalmal formations, multiple pregnancies, nifedipine allergic and Salbutamol allergic.*

Conclusion: *The conclusion shows that higher effectiveness can be obtained through magnesium sulfate (89.1%) forpreterm labour (acute tocolysis) than oral nifedipine.*

Keywords: *Magnesium Sulfate and Oral Nifedipine, Tocolysis Agents, Preterm Birth, Uterine Contractions.*

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INTRODUCTION:

Preterm labour pathogenesis is not clear and well defined as often it is preterm labour representing an earl y idiopathic normal labour activation or it is an outcome of pathologic mechanism. WHO defines preterm labour as gestation viability after (20 – 28) weeks, before 259 days or on the completion of 37 gestational weeks [1]. Various theories of labour initiation include progesterone withdrawal, oxytocin initiation and premature activation [2].Tocolysis management primarily aims to delay the delivery so that the ante partum glucocortico steroids course may be completed to reduce the idiopathic respiratory distress syndrome severity [3]. It also helps in the arrangement of utero transfer to intensive care unit having neonatal care facilities [4].Moreover, it also reduces morbidity and mortality rate by delaying delivery in order to avoid severe prematurity.

A study conducted on 71 females described magnesium sulfate to be used as a tocolysis agent for preterm labour cases [5]. This agent achieves a steady state of fetal by readily crossingthe placenta during the first hour of management.Apgar score was not significantly altered with concentrations of umbilical cord ≤ 4 mg/dL [6,7].Nifedipine is also useable orally for such cases. Nifedipine readily passes through the placenta and the comparison of mother and fetus is possible [8,9]. Due to the increased chances of mortality and morbidity, this research was carried out to compare the effectiveness of both drugs. Practical recommendations are possible in the light of these outcomes which may help in the better management. It can also help to benefit throughpregnancy prolongation byenabling administration of corticosteroid for the accelerated maturation of fetal lung helping in the reduction of perinatal morbidity and mortality among both fetus and mother.The objective of this research was to weigh the effectiveness of nifedipine and magnesium sulphate for tocolysis of preterm labour.

MATERIAL AND METHODS:

A pre-designed Performa was used to note down the research findings. SPSS software was used for statistical analysis. Chi-square test was applied (P-Value ≤0.05). We distributed the patients randomly in Group I & II; Group I was treated with magnesium sulfate (4 grams) intravenous dose over fifteen minutes followed by a maintenance intravenous dose (2-3 grams/hr) until the inhibition of uterine contractions to reduce possible side effects; Group II received nifedipine tablet (30 mg) in case of unstoppable uterine contractions in the course of twenty minutes followed by a tablet (30 mg). In case of no response,the same dose was repeated after half an hour. Nifedipine was also continued for five more days (30 mg twice / day).Senior gynecologist assessed all the patients while measuring the success rate in terms of stoppage of uterine contractions in 48 hours after initiation of therapy. If not so than it was unsuccessful. Uterine contractions cessation defined in preterm labour defined success.

RESULTS:

In the circle age of (16 – 35) years the mean age of Group I & II was respectively (24.66 ± 4.35) years and (23.98 ± 4.05) years(P-Value <0.05). Group-wise mean gestational age was (32.65 ± 3.71) weeks and (33.21 ± 3.31) weeks respectively for Group I & II (P-Value <0.05). There were 81 cases of uterine contractions cessation (89.01%) and 10 cases of no cessation (10.99%) in Group – I; whereas, for Group – II, 68 patients (74.73%) and 23 patients (25.27%) respectively. Therefore, Group I & II showed respective efficacy of 89.01% (magnesium sulfate) and 74.73% (oral nifedipine) (P-Value = 0.0124). Detailed outcomes of Age, Gestational Age, Parity and Efficacy are given in the tabular data.

Table – I: Age-wise stratification

Age	Group – I (91)		Group – II (91)		Total (182)	
	Number	Percentage	Number	Percentage	Number	Percentage
16 – 20 Years	27	29.67	28	30.77	55	30.22
21 – 30 Years	44	48.35	46	50.55	90	49.45
30 – 35 Years	20	21.98	17	18.68	37	20.33
Mean ± SD	24.66 ± 4.35		23.98 ± 4.05		24.24 ± 4.15	

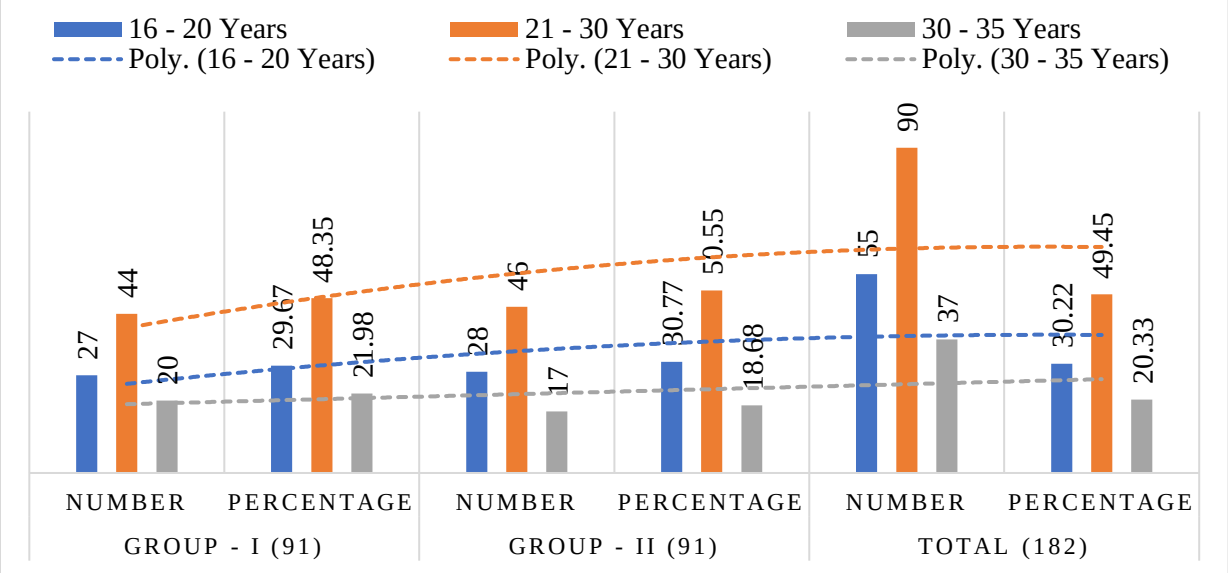


Table – II: Stratification of Gestational Age

Gestational Age	Group – I (91)		Group – II (91)		Total (182)	
	Number	Percentage	Number	Percentage	Number	Percentage
28 – 30 Weeks	18	19.78	14	15.38	32	17.58
31 – 33 Weeks	36	39.56	35	38.46	71	39.01
34 – 36 Weeks	37	40.66	42	46.15	79	43.41
Mean ± SD	32.65 ± 3.71		33.21 ± 3.31		32.82 ± 3.35	

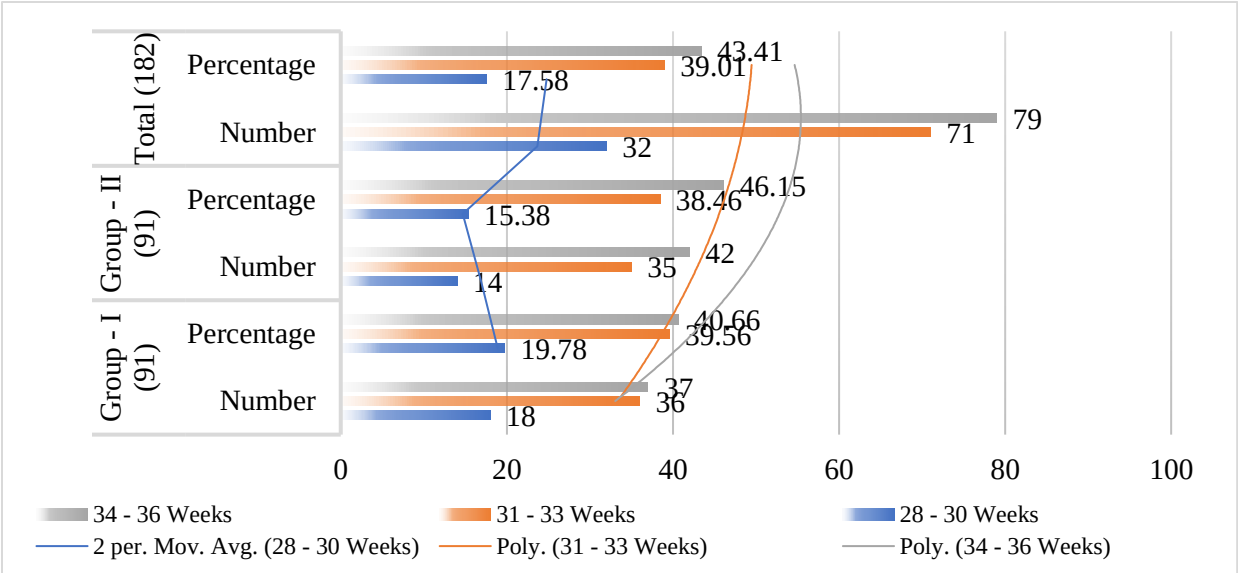


Table – III: Group-wise Parity Status

Parity	Group – I (91)		Group – II (91)		Total (182)	
	Number	Percentage	Number	Percentage	Number	Percentage
Primiparous	49	53.85	44	48.35	93	51.1
Multiparous	42	46.15	47	51.65	89	48.9

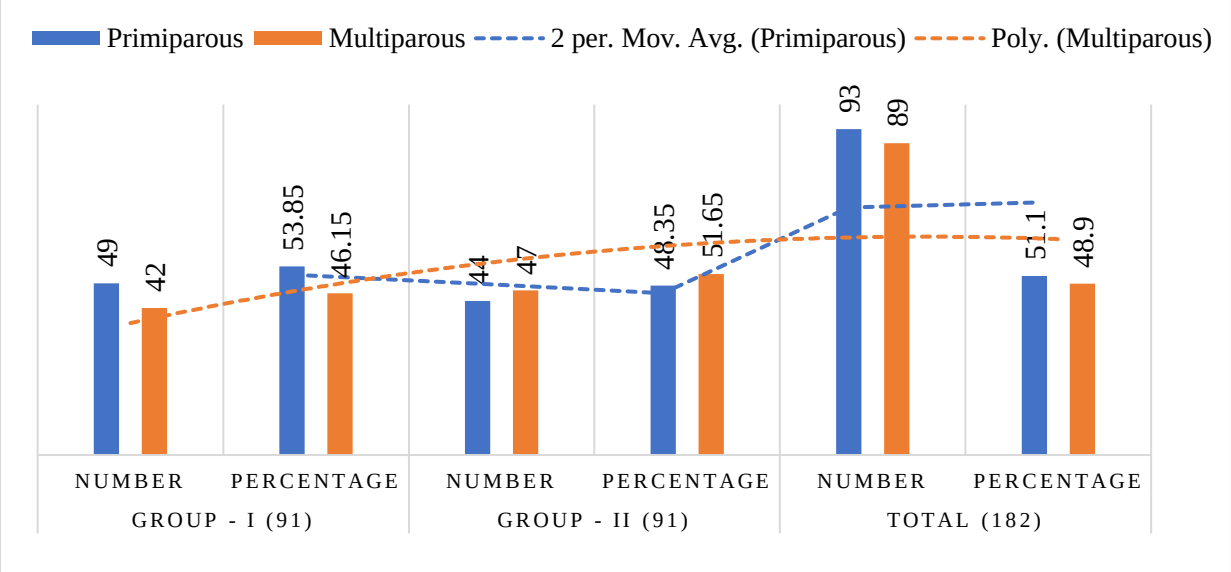


Table – IV: Group-wise Efficacy

Efficacy	Group – I (91)		Group – II (91)	
	Number	Percentage	Number	Percentage
Yes	81	89.01	68	74.73
No	10	10.99	23	25.27

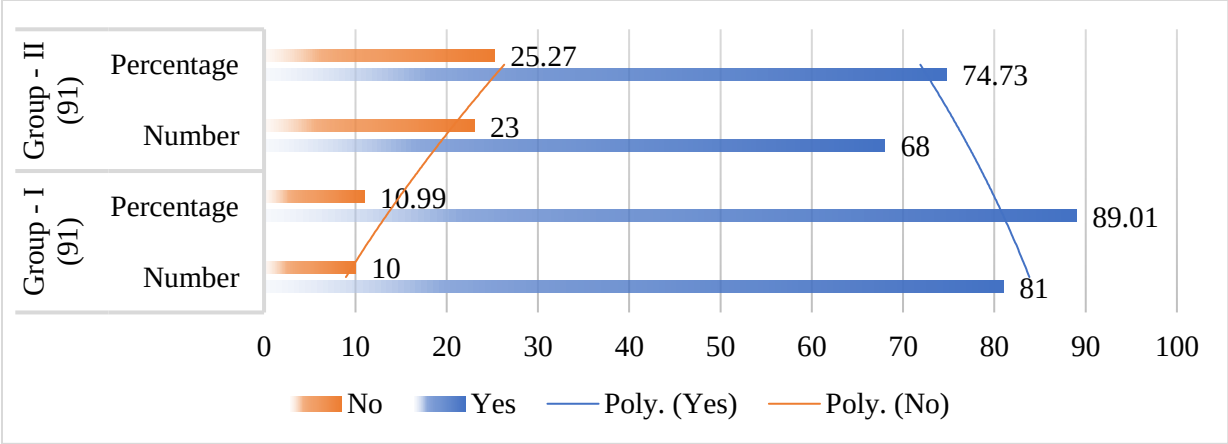
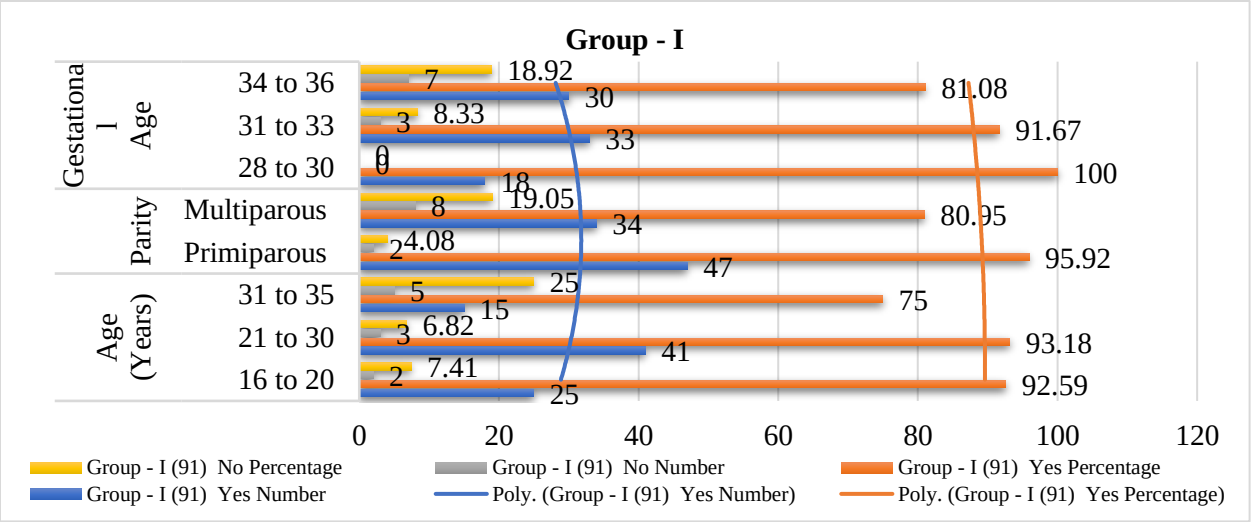
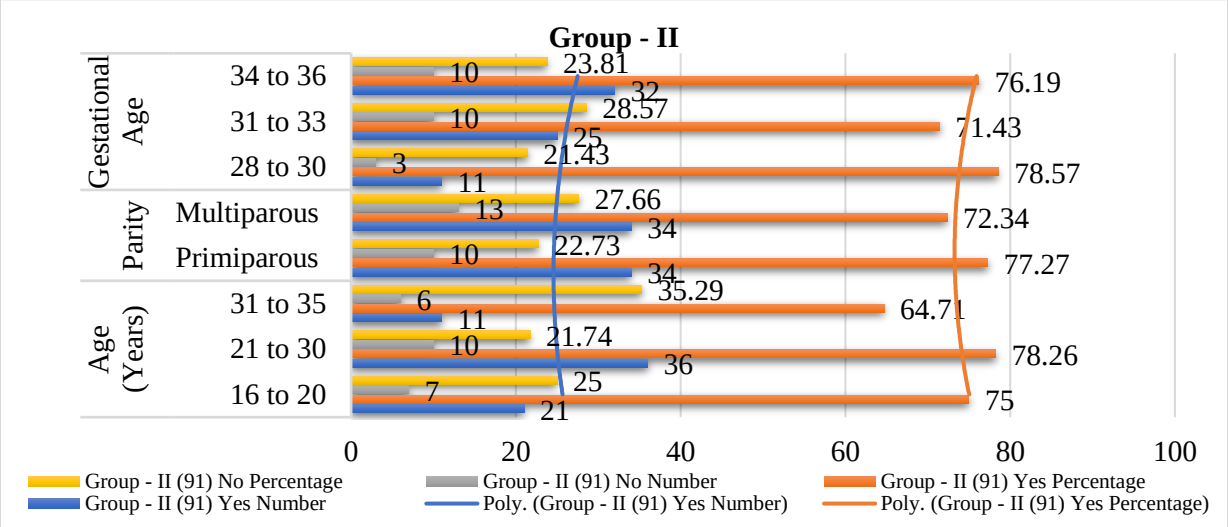


Table – V: Efficacy with respect to Age, Gestational Age and Parity

Efficacy		Group - I (91)				Group - II (91)				P-Value
		Yes		No		Yes		No		
		No	%	No	%	No	%	No	%	
Age (Years)	16 to 20	25	92.59	2	7.41	21	75	7	25	0.0779
	21 to 30	41	93.18	3	6.82	36	78.26	10	21.74	0.0441
	31 to 35	15	75	5	25	11	64.71	6	35.29	0.4948
Parity	Primiparous	47	95.92	2	4.08	34	77.27	10	22.73	0.007
	Multiparous	34	80.95	8	19.05	34	72.34	13	27.66	0.33
Gestational Age	28 to 30	18	100	0	0	11	78.57	3	21.43	0.03
	31 to 33	33	91.67	3	8.33	25	71.43	10	28.57	0.02
	34 to 36	30	81.08	7	18.92	32	76.19	10	23.81	0.59





DISCUSSION:

Magnesium sulfate (MgSO4) is a common agent which helps in pre-term labour management. The effects of magnesium sulphate are same as of terbutaline so it is also a primary tocolysis agent [10]. Preterm labour refers to uterine contractions presence with suitable intensity and frequency which can affect the progressive dilation and effacement of the cervix before term gestation [11, 12].

We have made a comparison of oral nifedipine and magnesium sulphate in this research for (≥ 48 Hrs) in acute tocolysis for preterm labour cases. Group I & II respective mean age was (24.66 ± 4.35) years and (23.98 ± 4.05) years.There were 90 patients (49.45%) in the bracket of (21 – 30) years which forms the majority of the patients in both groups and it is comparable with the outcomes quoted in another research having 51% patients as primigravida i.e. 51.1% [13].Young primigravida females are at an increased risk of preterm labour also confirmed by two different research studies [7, 9]. Group I & II mean gestational age was respectively (32.65 ± 3.71) weeks and (33.21 ± 3.31) weeks which has been supported by another study with an outcome of mean age as 32.06 weeks and 32.23 weeks respectively for magnesium sulphate and nifedipine groups.

We reported uterine concentration cessation among (89.01%) patients after the management of magnesiumsulfate while (74.73%) after oral intake of nifedipine. Nazand Kawagoe also study both interventions and found that at 48 Hrs uterine concentration were ceased in 74.1% patients; whereas pregnancy was prolonged among 90% females after the treatment of magnesium sulphate after more than 48 Hrs [14].Another trial reported 10% chances of adverse effects for nifedipine and 21.7% chances for magnesium sulphate [15]. Adverse neonatal outcomes were not significantly different; moreover, the admission rate was reduced along with hospitalization duration at NICU having respective proportions of (37.30% against 51.90%) for nifedipine and magnesium sulphate [15].

Lyell reported different outcomes of the tocolytic effect of both nifedipine (38.6%) and magnesium sulphate (49.2%) in the first 48 Hrs of treatment [7]. The delivery delay was (48%) for nifedipine and (38%) for magnesium sulphate. Glock reported that both medicines produce similar outcomes and are equally effective in the delaying labour for more than 48 Hrs respectively 92% and 93% [9]. Side effects were also similar in both groups; whereas, 4 magnesium sulphate (10%) treated patients were discontinued medicines due to severe symptoms.

CONCLUSION:

Magnesium sulfate is a better first-line tocolysis agent for delaying delivery. Prolongation of pregnancy can bring a few more benefits. The outcomes show that higher efficacy can be obtained through magnesium sulfate (89.1%) for preterm labour (acute tocolysis) than oral nifedipine. Young primigravida females are better treated with magnesium sulfate.

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