

PRETERM LABOUR IN PATIENTS WITH INTERPREGNANCY INTERVAL LESS THAN 6 MONTHS.

DR. HAFSAH NAZ,
MBBS
NISHTAR HOSPITAL, MULTAN, PAKISTAN.

DR. ATIF IKRAM,
MBBS
NISHTAR HOSPITAL, MULTAN, PAKISTAN.

DR. USMAN WARRAICH,
MBBS
NISHTAR HOSPITAL, MULTAN, PAKISTAN.

Abstract;

Background; The time interval between pregnancies is considered to be an important and modifiable risk factor in terms of adverse perinatal outcomes. Traditionally women with a short inter-pregnancy interval will not have sufficient time to recover and get ready for the subsequent pregnancy. This includes socio-economic, cultural, psychological and physical body preparedness. This study was conducted to document the frequency of preterm labor in women having short interpregnancy interval, as there is no such study done in Pakistan on this topic.

Objective: To determine the frequency of preterm labour in patients with interpregnancy interval less than 6 months. **Material and methods;** Patients were selected from OPD of department of Obstetrics and Gynecology, Nishtar hospital Multan, according to inclusion and exclusion criteria of this study. Detailed history was taken regarding demographic distribution, parity, BMI and duration of pregnancy. Duration of gestation was calculated from patient's last menstrual period (LMP). Examination was done including general physical examination such as per abdominal examination (SFH, uterine contractions and engagement of head) and per vaginal examination (cervical dilation & effacement and leaking per vaginum). Patients were followed till delivery for outcome variable i.e. preterm birth. Data was transferred and analyzed by SPSS version 20. **Results;** Mean age of our study cases was noted to be 28.00 ± 4.82 years (with minimum age of our study cases was 20 years while maximum age was noted to be 39 years). Our study results have indicated that majority of our study cases i.e. 151 (67.7 %) were aged 20 – 30 years of age. Of these 90 study cases, 125 (56.1%) were from rural areas, 179 (80.3 %) were normal weight 27(12.1%) were overweight and 17 (7.6 %) were obese. One hundred ninety two (86.1 %) were illiterate. Of these 223 study cases, 178 (79.8 %) were having poor socioeconomic status and 45 (20.2%) were having middle income status, 27 (12.1%) were taking steroid therapy. Of these 223, 36(16.1%), 72 (32.3%) were Saraiki, 27 (12.1%) were Urdu speaking, 62 (27.8%) were baloch, 18 (8.1%) were pathan and 8 (3.6%) were having Sindhi ethnicity. Mean body mass index (BMI) of our study cases was noted to be 21.98 ± 2.21 Kg/m² (with minimum BMI was 18.9 kg/m² while maximum BMI was 32.1 kg/m²). Mean interpregnancy interval was 4.52 ± 1.03 months (with minimum interpregnancy interval was 2 months while maximum interpregnancy interval was 6 months). Mean gestational age of our study cases was noted to be 36.19 ± 3.68 weeks (with minimum gestational age was 28 weeks while maximum gestational age was 40 weeks). Preterm labor was noted in 63 (28.3 %) our study cases and 170 (76.2%) of our study cases were having parity more than 3. **Conclusion;** Short interpregnancy interval less than 6 months leads to adverse pregnancy outcomes. Very high frequency of preterm labor was noted in our study cases having interpregnancy interval less than 6 months. Short interprgnancy interval was common in poor, uneducated and rural ladies. Preterm labor was significantly associated with age, residential status, obesity, ethnicity, steroid therapy and parity. Birth spacing is an issue which women should have some control over. Educational interventions, including birth control, should be applied during prenatal visits and following delivery.

Keywords; Short interpregnancy Interval, gestational age, preterm labor.

Introduction:

Preterm birth represents the single largest cause of mortality and morbidity for newborns and a major cause of morbidity for pregnant women^{1, 2}. Spontaneous preterm labor, a syndrome caused by multiple pathologic processes, leads to 70% of preterm births. The prevention and the treatment of preterm labor have been long-standing challenges^{3, 4}. The incidence of preterm delivery varies between 7 and 12%. This rate is higher in developing countries where there is limited availability of neonatal care and there are poorer clinical outcomes⁵. Infants born preterm account for 75% of perinatal deaths and half of all childhood neurodevelopmental disabilities. Consequently, PTB contributes to a large burden of disease, including high immediate and long-term medical care costs, the need for special education services and institutionalised care for physically and mentally

disabled infants ^{6,7}. The etiology of preterm birth (PTB) is multifactorial: 50% of the cases are idiopathic while 20–40% are disease specific or medically indicated deliveries such as pre-eclampsia or fetal growth restriction (FGR), which require delivery. The remaining 25–30% of PTB can be attributed to intrauterine infection and/or inflammation ⁸.

A short interpregnancy interval (IPI) is a risk factor for preterm delivery among women of reproductive age ⁹. Interpregnancy interval – the time between the birth of one child and the conception of the next – appears to be one factor associated with preterm birth. Interpregnancy intervals less than 18 months and greater than 59 months are significantly associated with an increased risk of adverse perinatal outcomes. The biological mechanism between short interpregnancy interval and poor maternal and neonatal outcomes is hypothesized to be due to insufficient time for the mother to recover from the nutritional burden and stress of the previous pregnancy. Specifically, depleted maternal protein, low energy status, and deficiencies in folate and iron have been considered ¹⁰. Preterm labour was seen in 29.3 % ¹¹ patients with short interpregnancy interval while in another study preterm birth was seen in 7.7 % ¹² of pregnant ladies with short IPI. Howard et al ¹⁰ reported 26.83 % preterm births in patients with short IPI.

Materials and methods

Multigravida patients with IPI < 6 months having age 20-40 years having gestational age equal or more than 24 weeks (on LMP) was followed till delivery were included in our descriptive study from January 2016 to March 2017. Patients presenting with multiple gestations, patients with diabetes and hypertension and Patients with previous miscarriage and preterm births were excluded from our study. Patients were selected from OPD of department of Obstetrics and Gynecology, Nishtar hospital Multan, according to inclusion and exclusion criteria of this study. Detailed history was taken regarding demographic distribution, parity, BMI and duration of pregnancy. Duration of gestation was calculated from patient's last menstrual period (LMP). Examination was done including general physical examination such as per abdominal examination (SFH, uterine contractions and engagement of head) and per vaginal examination (cervical dilation & effacement and leaking per vaginum). Patients were followed till delivery for outcome variable i.e. preterm birth. Data was transferred and analyzed by SPSS version 20.

Results;

Our study comprised of a total of 223 pregnant ladies having short inter-pregnancy interval meeting inclusion criteria of our study. Mean age of our study cases was noted to be 28.00 ± 4.82 years (with minimum age of our study cases was 20 years while maximum age was noted to be 39 years). Our study results have indicated that majority of our study cases i.e. 151 (67.7 %) were aged 20 – 30 years of age. Of these 90 study cases, 125 (56.1%) were from rural areas, 179 (80.3 %) were normal weight 27(12.1%) were overweight and 17 (7.6 %) were obese. One hundred ninety two (86.1 %) were illiterate. Of these 223 study cases, 178 (79.8 %) were having poor socioeconomic status and 45 (20.2%) were having middle income status, 27 (12.1%) were taking steroid therapy. Of these 223, 36(16.1%), 72 (32.3%) were Saraiki, 27 (12.1%) were Urdu speaking, 62 (27.8%) were baloch, 18 (8.1%) were pathan and 8 (3.6%) were having Sindhi ethnicity. Mean body mass index (BMI) of our study cases was noted to be 21.98 ± 2.21 Kg/m² (with minimum BMI was 18.9 kg/m² while maximum BMI was 32.1 kg/m²). Mean interpregnancy interval was 4.52 ± 1.03 months (with minimum interpregnancy interval was 2 months while maximum interpregnancy interval was 6 months).

Mean gestational age of our study cases was noted to be 36.19 ± 3.68 weeks (with minimum gestational age was 28 weeks while maximum gestational age was 40 weeks). Preterm labor was noted in 63 (28.3 %) our study cases and 170 (76.2%%) of our study cases were having parity more than 3.

Table No. 1 Stratification of preterm labor with regards to obesity status. (n = 223)

Obesity	preterm labor		P – value
	Yes (n=63)	No (n=160)	
Normal weight (n=179)	45	134	0.043
Overweight (n =27)	09	18	
Obese (n=17)	09	08	

Table No. 2 Stratification of preterm labor with regards to mean gestational age. (n = 90)

preterm labor	Gestational age (In weeks)		P – value
	Mean	SD	
Yes (n=63)	32.00	3.45	0.000
No (n=160)	38.24	2.61	

Discussion;

The time interval between pregnancies is considered to be an important and modifiable risk factor in terms of adverse perinatal outcomes.¹³⁻¹⁵ The frequencies of “preterm births, small for gestational age birth, anemia, PROM and low birth weights” have all been generally reported to show a significant J-shaped relationship to the time interval with regard to pregnancies¹⁶⁻¹⁷.

Our study comprised of a total of 223 pregnant ladies having short inter-pregnancy interval meeting inclusion criteria of our study. Mean age of our study cases was noted to be 28.00 ± 4.82 years (with minimum age of our study cases was 20 years while maximum age was noted to be 39 years). Our study results have indicated that majority of our study cases i.e. 151 (67.7 %) were aged 20 – 30 years of age. A study conducted by Al – Jasmi Fatima et al¹⁸ from UAE reported mean maternal age 27.6 ± 4.9 years of women. These results are similar to that of our study results. Howard et al¹⁰ has also documented similar results in pregnant ladies with short interpregnancy interval. Lilungulu et al¹¹ reported 23.4 ± 1.7 years mean age of pregnant ladies with short interpregnancy interval which is in compliance with that of our study results. Hussaini et al¹⁹ reported similar findings.

Of these 90 study cases, 125 (56.1%) were from rural areas, 179 (80.3 %) were normal weight 27(12.1%) were overweight and 17 (7.6 %) were obese. One hundred ninety two (86.1 %) were illiterate. Lilungulu et al¹¹ also reported poor educational status being predictor of short interpregnancy interval and reported 99.1% ladies were having up to primary level of education. Howard et al¹⁰ reported that majority of women were having secondary level education which is different from our study results. The reason for this difference is because Howard conducted their study in USA where literacy rates are quite higher than that of our population.

Of these 223 study cases, 178 (79.8 %) were having poor socioeconomic status and 45 (20.2%) were having middle income status, 27 (12.1%) were taking steroid therapy. Mean body mass index (BMI) of our study cases was noted to be 21.98 ± 2.21 Kg/m² (with minimum BMI was 18.9 kg/m² while maximum BMI was 32.1 kg/m²). Al – Jasmi Fatima et al¹⁸ reported similar results from UAE.

Mean interpregnancy interval was 4.52 ± 1.03 months (with minimum interpregnancy interval was 2 months while maximum interpregnancy interval was 6 months). Mean gestational age of our study cases was noted to be 36.19 ± 3.68 weeks (with minimum gestational age was 28 weeks while maximum gestational age was 40 weeks). Preterm labor was noted in 63 (28.3 %) our study cases. Howard et al¹⁰ reported 26.83 % preterm births in patients with short IPI. These results are close to our study results. Lilungulu et al¹¹ reported preterm labour was seen in 29.3 % patients with short interpregnancy interval which is in compliance with that of our study results. While in another study preterm birth was seen in 7.7 %¹² of pregnant ladies with short IPI. These results are quite low than that reported in our study.

Conclusion;

Short interpregnancy interval less than 6 months leads to adverse pregnancy outcomes. Very high frequency of preterm labor was noted in our study cases having interpregnancy interval less than 6 months. Short interpregnancy interval was common in poor, uneducated and rural ladies. Preterm labor was significantly associated with age, residential status, obesity, ethnicity, steroid therapy and parity. Birth spacing is an issue which women should have some control over. Educational interventions, including birth control, should be applied during prenatal visits and following delivery.

References;

1. Vogel JP, Nardin JM, Dowswell T, West HM, Oladapo OT. Combination of tocolytic agents for inhibiting preterm labour. Cochrane Database Syst Rev. 2014;7:CD006169. doi: 10.1002/14651858.CD006169.

2. Flenady V, Wojcieszek AM, Papatsonis DN, Stock OM, Murray L, Jardine LA, et al. Calcium channel blockers for inhibiting preterm labour and birth. *Cochrane Database Syst Rev.* 2014;6:CD002255. doi: 10.1002/14651858.CD002255.
3. Romero R, Dey SK, Fisher SJ. Preterm labor: one syndrome, many causes. *Science.* 2014;345(6198):760-5. doi: 10.1126/science.1251816.
4. Martinez de Tejada B, Karolinski A, Ocampo MC, Laterra C, Hösli I, Fernández D, et al. Prevention of preterm delivery with vaginal progesterone in women with preterm labour (4P): randomised double-blind placebo-controlled trial. *BJOG.* 2015;122(1):80-91. doi: 10.1111/1471-0528.13061.
5. Chang HH, Larson J, Blencowe H, Spong CY, Simpson JL, Lawn JE. Preterm births in countries with a very high human development index—authors' reply. *Lancet.* 2013;381:1356–7.
6. Martin JA, Hamilton BE, Ventura SJ, Osterman MJ, Kirmeyer S, Mathews TJ, et al. Births: final data for 2009. *Natl Vital Stat Rep.* 2011;60:1–70.
7. Murray CJ, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet.* 2012;380:2197–23.
8. Yang S, Reid G, Challis JRG, Kim SO, Gloor GB, Bocking AD. Is there a role for probiotics in the prevention of preterm birth? *Front Immunol.* 2015;6:62. doi: 10.3389/fimmu.2015.00062
9. Nerlander LM, Callaghan WM, Smith RA, Barfield WD. Short interpregnancy interval associated with preterm birth in U S adolescents. *Matern Child Health J.* 2015 Apr;19(4):850-8.
10. Howard EJ, Harville E, Kissinger P, Xiong X. The association between short interpregnancy interval and preterm birth in Louisiana: A Comparison of Methods. *Matern Child Health J.* 2013;17(5):933–9.
11. Lilungulu A, Matovelo D, Kihunrwa A, Gumodoka B. Spectrum of maternal and perinatal outcomes among parturient women with preceding short inter-pregnancy interval at Bugando Medical Centre, Tanzania. *Matern Health Neonatol Perinatol.* 2015;1(1).doi:10.1186/s40748-014-0002-1.
12. De-Weger FJ, Hukklehoven CW, Serroyen J, Te-Velde ER, Smits LJM. Advanced Maternal age, short interpregnancy interval, perinatal outcome. *Am J Obstet Gynecol* 2011;204:421-9.
13. Cheslack Postava K¹, Winter AS. Short and long interpregnancy intervals: correlates and variations by pregnancy timing among U.S. women. *Perspect Sex Reprod Health.* 2015 Mar;47(1):19-26.
14. Mburia-Mwalili A^{1,2}, Yang W^{1,3}. Interpregnancy interval and birth defects. *Birth Defects Res A Clin Mol Teratol.* 2015 Nov;103(11):904-12.
15. Zhu BP¹. Effect of interpregnancy interval on birth outcomes: findings from three recent US studies. *Int J Gynaecol Obstet.* 2005 Apr;89 Suppl 1:S25-33.
16. Chen I¹, Jhangri GS², Lacasse M³, Kumar M⁴, Chandra S³. Relationship Between Interpregnancy Interval and Adverse Perinatal and Neonatal Outcomes in Northern Alberta. *J Obstet Gynaecol Can.* 2015 Jul;37(7):598-605.
17. Knight AK, Smith AK. Epigenetic Biomarkers of Preterm Birth and Its Risk Factors. *Genes (Basel).* 2016 Apr 13;7(4). pii: E15. doi: 10.3390/genes7040015.
18. Al-Jasmi F, Al-Mansoor F, Al-Sheiba A, Carter AO, Carter TP, Hossain MM. Effect of interpregnancy interval on risk of spontaneous preterm birth in Emirati Women, United Arab Emirates. *Bull World Health Organ.* 2002;80(11):871-5.
19. Hussaini KS¹, Ritenour D, Coonrod DV. Interpregnancy intervals and the risk for infant mortality: a case control study of Arizona infants 2003-2007. *Matern Child Health J.* 2013 May;17(4):646-53.