

Association Between Pre-Term Labour and Inter Pregnancy Interval

MONA FATIMA¹, UROOJ NAZ², ARUNA KUMARI HIRA³, ANEELA HABIB⁴, PROF SARAH KAZI⁵, HARIS MAJEED⁶

¹Resident, Gynae & OBS Department, Civil Hospital Karachi

^{2,3}Senior Registrar, Gynae & OBS Department, Civil Hospital Karachi

⁴Assistant Professor, Gynae & OBS Department, Civil Hospital Karachi

⁵Professor, Gynae & OBS Department, Civil Hospital Karachi

⁶Interventional Cardiologist, National Institute of Cardiovascular Diseases (NICVD) Karachi

Corresponding author: Urooj Naz, Email address: dr_uroojnaz@hotmail.com

ABSTRACT

Objectives: To determine the frequency of preterm labour in association with interpregnancy interval among pregnant women visiting tertiary care Hospital.

Subject and Methods: This prospective cross-sectional study was performed at Unit-I, Obstetrics and Gynaecology Department, Civil Hospital Karachi; from June to November 2020. A total of 190 women with singleton pregnancy confirmed by ultrasound were included. After taking detailed medical history regarding previous fetal death and C-section was recorded either patient goes into preterm labour or not and confirmed by history for short and prolong interpregnancy interval (IPI). Data was collected by pre-designed study proforma.

Results: The average age of study subjects was 26.27±4.07 years. The frequency of preterm labour among the pregnant women was 51.05%. The rate of preterm was significantly higher in those women who had with short inter interpregnancy interval ($p=0.0005$).

Conclusion: Our findings clearly show that a short interval in inter-pregnancy is a cause of premature birth. Preterm birth can also be indicated by the antenatal care visits, inter-pregnancy complications, and having a birth defect. Premature birth minimization can enhance overall newborn's health and can lead to considerable minimization of neonatal death in the future.

Keywords: Preterm labor, prolong pregnancy interval, neonatal health

INTRODUCTION

A preterm birth is when a baby is born before 37 weeks of pregnancy, according to the World Health Organization (WHO)¹. Premature birth is associated with a raised risk of complications among newborns. Preterm delivery problems are the most prevalent cause of death among neonates and the secondmost prevalent factor of death in children under the age of five years, after pneumonia²⁻⁴. The WHO reports that premature birth affects around 11% of all births worldwide³. According to UNICEF, around 860,000 preterm births occur in Pakistan each year, with nearly 102,000 children dying as a result of complications⁴. Despite the fact that there are multiple risk factors for preterm birth, roughly two-thirds of preterm birth cannot be attributable to any of them⁵. A history of preterm delivery, early/premature rupture of membranes (PROM), anaemia, low socioeconomic conditions, multiple gestation, smoking, and a short interval in pregnancies are all known risk factors⁶. Inter-pregnancy intervals that are too short are linked to poor mother and newborn health. A short inter-pregnancy gap is a risk factor for having a baby with a low birth weight (LBW). Premature birth at 37 weeks of pregnancy, rather than LBW, is responsible for 80% of all neonatal deaths in the United States⁷. In developing countries, women and children are becoming more aware of complete birth spacing and are putting it into practice. The time interval between the first child's birth and conceiving the second pregnancy is known as the inter-pregnancy interval (IPI)⁸. The interval is calculated as the difference between the current pregnancy's due date and the prior pregnancy's due date minus the current pregnancy's gestational age. When the IPI is larger than 5 years, there are multiple definitions for short and long IPI. Several studies have been conducted in which brief IPI has been considered in relation to various fetomaternal outcomes⁹. It is usually observed that the

females with a short inter-pregnancy interval (IPI) do not get enough time to recover their health and prepare for their future pregnancy. IPI can result from the several of reasons, including socioeconomic, cultural, and psychological factors¹⁰. This study was designed in a setup where women usually belong to low socioeconomic and educational status and have low antenatal visits and in these females few preterm-birth-associated modifiable risk factors are observed with short inter-pregnancy interval being the most prevalent factor, so this study intended to see the frequency of preterm labour in association with interpregnancy interval among pregnant women visiting tertiary care hospital.

MATERIAL AND METHODS

This prospective cross-sectional study was done at Unit-I, Obstetrics, and Gynaecology Department, Civil Hospital Karachi; during six months from June to November 2020. A total of 190 women aged between 20 and 40 years of any parity with gestational age between 20 and 40 weeks with singleton pregnancy and cephalic presentation confirmed by ultrasound were included. All the females having diabetes mellitus, polyhydramnios and those who were unwilling to contribute in the study were excluded. Non-probability sampling technique was used. After all, participants had given their explicit consent, their age, gestational age, and parity were recorded. The time of the gap between 1st birth and the date of the corresponding higher order births or in the technical term Labeled Index Pregnancy was measured as inter-pregnancy interval (IPI). The recommendation of short and long IPI was based on <18 months and > 59 months, respectively. Preterm birth is described as uterine contractions that begin before 37 weeks of pregnancy and result in cervical changes. The effacement (thinning of the

cervix) and dilation (the opening of cervix to enable fetus entry into birth canal) are two cervix changes. All the data were collected via study proforma. The SPSS Software version 22 was used to enter and analyze all of the obtained data.

RESULTS

A total of 190 singleton pregnancies confirmed by ultrasound were studied. The average age of the women was 26.27±4.07 years similarly mean neonatal birth weight was 2.52±0.68 kg. Out of all 48.42% women were Primiparous and 51.58% were multiparous, and most of the women 124(65.26%) underwent cesarean section. Frequency of preterm labour among the pregnant women was 51.05% (97/190) as presented in table.1

The rate of preterm was significantly high in women who had with short IPI (p=0.0005). Table.2

Similarly rate of preterm was also observed with respect to age and parity, it was statistically insignificant according to age (p=0.838) and was statistically significant

according to parity (p=0.0005), results showed in table.3

Table.1 Descriptive statistics of demographic variables n=190

Variables		Statistics
Age		26.27+4.07 years
Birth weight (kg)		2.52+0.68kg
Parity	Primiparous	92(48.42%)
	Multiparous	98(51.58%)
Mode of delivery	SVD	66(37.74%)
	C-section	124(65.26%)
Pre-term labour	Yes	97(51.05%)
	No	93(48.95%)

Table 2. Frequency of preterm labour among short and prolonged pregnancy interval n=190

Inter pregnancy Interval (IPI)	Preterm		Total	P-Value
	Yes	No		
<18 Short IPI	53(88.3%)	7(11.7%)	60	0.0005
18-59	32(28.6%)	80(71.4%)	112	
>59 Long IPI	12(66.7%)	6(33.3%)	18	

Table 3. Frequency of preterm labour according to age and parity n=190

Variables		Preterm		Total	P-value
		Yes	No		
Age groups	≤ 25	48(49%)	50(51%)	98	0.838
	26-30	35(53%)	31(47%)	66	
	>30	14(53.8%)	12(46.2%)	26	
Parity	Primiparous	61(66.3%)	31(33.7%)	92	0.005
	Multiparous	36(36.7%)	62(63.3%)	98	

DISCUSSION

Preterm birth is common in urbanized countries, accounting for up to 5%-7% of all live births¹¹. Preterm birth is caused by a number of risk factors, some of which are changeable, such as the interpregnancy gap. In developing nations, women and children are becoming more aware of the benefits of complete birth spacing and are putting it into practise¹². In this study, the average age of the women was 26.27±4.07 years with a mean birth weight of the children was 2.52±0.68 kg. Wagura et al¹³ reported that the mean age mothers were 26.0±5.0 years and majority (89%) of the mothers were aged ≥20 years. In the study by Ashfaq et al,¹⁴ females of age range 16-35 years (mean age: 27.47±4.877 years) had preterm birth. It has also been documented in the literature that even after adjusting for confounding factors, the mothers of age ≥35 years had the greatest likelihood of poor fetomaternal outcome at the onset of childbearing, as compared to mothers of age range 20-29 years.¹⁵ In the previous 2 and half decades, the rate of premature births has risen by 33%, primarily attributable to an upsurge in late premature births.¹⁶ The literature suggests that preterm delivery is more prevalent in male neonates (55.03%).¹⁷ The total prevalence of premature births was found to be 11.1% in a study that included 99 nations.¹⁸ Another study looked at data from low-income and middle-income nations and found that 8.2% of babies were born prematurely.¹⁹ Unfortunately, besides numerous studies reported until now, there is still no uniformity in the occurrence of preterm birth over the world, with estimates ranging from 1.52²⁰ to 41.5%²¹. Preterm labour was shown to be prevalent in 51.05% of pregnant women in this study. The current study's

prevalence of preterm delivery is substantially greater than the prevalence reported by Olugbenga et al in a study in a Nigerian teaching Hospital.²³ The disparity in preterm birth statistics between our study and that of Olugbenga et al., in a nearly identical context (teaching hospitals), might be justified by the different ways of determining the babies' gestational age. While Olugbenga et al did not include the mothers who were dubious for their delivery dates, those with disparity between gestation of greater than 2 weeks by dates and Ballard's assessment, and the females with multiple gestations. Our study exclusively relied on Finn Strom score based clinical assessment of gestational age. Preterm birth was significantly higher in women with short IPI (p=0.0005) in this study. Other findings revealed that a short interpregnancy interval (SIPI) increases the risk of premature delivery, which is consistent with the research conducted in Ethiopia²³ and Pakistan²⁴. According to the findings from Pakistan, mothers who had an IPI of <1 year had a higher rate of preterm delivery than mothers who had the recommended IPI. A possible explanation for this disparity could be the inability of SIPI mothers to recover from biological stresses enforced by their previous pregnancy, leading to macronutrient deficiency in the mothers, cervical insufficiency, folate depletion, vertical communication of infections, uterine scars' partial healing, endometrial blood vessels' abnormal remodeling, anemia, and an increased likelihood of pregnancy-associated complications. As a result, advocating and encouraging couples to keep the recommended inter-pregnancy period will lower the number of preterm births. The strengths of our study were prospective study and eligibility criteria were applied strictly to control the biasness.

CONCLUSION

It was observed that the short interpregnancy interval is a causative factor of premature birth. Premature birth can also be predicted by the number of ANC visits, complications throughout pregnancy, and the presence of a birth abnormality. Preterm birth reduction can enhance overall infant health and considerably lower neonatal death in the future.

REFERENCES

- World Health Organization. Preterm birth, Fact sheet: World Health Organization: 2018. Available from: <https://www.who.int/news-room/fact-sheets/detail/preterm-birth>.
- Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. *Lancet*. 2015;385:430–40.
- Vogel JP, Chawanpaiboon S, Moller A-B, Watananirun K, Bonet M, Lumbiganon P. The global epidemiology of preterm birth. *Best Pract Res Clin Obstet Gynaecol*. 2018;52:3–12.
- Asgharnia M, Varasteh T, Pourmarzi D. Inter-Pregnancy Interval and the Incidence of Preterm Birth. *J Fam Reprod Health* 2020; 14(1): 52-6.
- Reduction in Preterm Births and Child Deaths Imperative to Achieve Global Goal for Health: https://www.unicef.org/pakistan/media_10087.html
- DeFranco EA, Stamilio DM, Boslaugh SE, Gross GA. A short interpregnancy interval is a risk factor for preterm birth and its recurrence. *Am J Obstet Gynecol*. 2007;197:264;1-6.
- Huddlestone JF. Preterm labor. *Clinical Obstet Gynaecol* 1982;25:123-36.
- Lilungulu A, Matovelo D, Kihunrwa A, Gumodoka B. Spectrum of maternal and perinatal outcomes among parturient women with preceding short interval
- DeFranco EA, Ehrlich S, Muglia LJ. Influence of interpregnancy interval on birth timing. *Bjog* 2014;121(13):1633-40.
- Ashfaq M, Mateen A, Mateen H, Hanif A. Frequency of short interpregnancy interval in females with preterm birth. *P J M H S*. 2018;11(2): 2017582.
- Beck S, Wojdyla D, Say L, Betran AP, Merialdi M, Requejo JH, et al. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. *Bulletin of the World Health Organization* 2010;88(1):31-8.
- Bener A, Saleh NM, Salameh KMK, Basha B, Joseph S, Samson N, et al. The impact of the interpregnancy interval on birth weight and other pregnancy outcomes. *Revista Brasileira de Saúde Materno Infantil* 2012;12(3):233-41.
- Conde-Agudelo A, Rosas-Bermúdez A, Kafury-Goeta AC. Birth spacing and risk of adverse perinatal outcomes: a meta-analysis. *Jama* 2006;295(15):180923.
- Nabukera SK, Wingate MS, Kirby RS, Owen J, Swaminathan S, Alexander GR, et al. Interpregnancy interval and subsequent perinatal outcomes among women delaying initiation of childbearing. *Journal of Obstetrics and Gynaecology Research* 2008;34(6):941-7.
- Smith GC, Pell JP, Dobbie R. Interpregnancy interval and risk of preterm birth and neonatal death: retrospective cohort study. *Bmj* 2003;327(7410):313
- Wagura P, Wasunna A, Laving A, Wamalwa D and Ng'ang'a P. Prevalence and factors associated with preterm birth at kenyatta national hospital. *Pregnancy and Childbirth* 2018;18:107
- Ashfaq M, Mateen A, Mateen H, Hanif A. Frequency of Short Interpregnancy Interval in Females with Preterm Birth. *PJMHS*. 2017;11:1-5
- Eleje GU, Ezebialu I, Eke N. Inter-Pregnancy Interval (IPI): What Is The Ideal? *Afrimedical Journal* 2013;2(1):36-8.
- Shapiro-Mendoza CK, Lackritz EM. Epidemiology of late and moderate preterm birth. *Sem Fetal and Neonat Med*. 2012;17(3):120-5.
- Alam M. Pakistan fourth in premature births, says report. *Dawn news*. [Online available from] <http://www.dawn.com/news/715198/pakistan-fourth-in-premature-births-says-report>. Retrieved. 2015.
- Tehrani N, Ranjbar M, Shobeiri F. The Prevalence and Risk Factors for Preterm Delivery in Tehran, Iran. *Journal of Midwifery and Reproductive Health*. 2016;4 (2):600-4.
- Bastek JA, Sammel MD, Jackson TD, Ryan ME, McShea MA, Elovitz MA. Environmental variables as potential modifiable risk factors of preterm birth in Philadelphia, PA. *Am J Obstet Gynecol*. 2015;212(2): 2361-10.
- Olugbenga A, Mokuolu BM, Suleiman OO, Adesiyun A, Adeniyi B. Prevalence and determinants of pre-term deliveries in the University of Ilorin Teaching Hospital, Ilorin, Nigeria. *Pediatric Report*. 2010;2(Suppl 3):11–3.
- Adane. Adverse birth outcomes among deliveries at Gondar University Hospital, Northwest Ethiopia. *BMC Pregnancy Childbirth*. 2014;14:90.
- Arbab M, Khan MB, Murad M, Abdullah S, Khan MW. Study of factors affecting and causing low birth weight. *J Sci Res*. 2014;6:387–94.
- Conde-agudelo A, Rosas-bermudez A, Castaño F. Effects of birth spacing on maternal, perinatal, infant, and child health: a systematic review of causal mechanisms. *Stud Fam Plan*. 2012;43(2):93–114.
- Rustein SO. Further evidence of the effect of preceding birth intervals on neonatal, infant and under-five mortality and nutritional status in developing countries: evidence from the demographic and health surveys. *Demogr Health Res*. 2008;41:1–78.
- Barros FC, Bhutta ZA, Batra M, Hansen TN, Victora CG, Rubens CE. Global report on preterm birth and stillbirth (3 of 7): evidence for effectiveness of interventions. *BMC Pregnancy Childbirth*. 2010;10(1):S3.