Austin Journal of Nursing & Health Care

Open Access

Austin Publishing Group

Research Article

Risk Factors of Preterm Birth among Palestinian Women: Case Control Study

Adnan Lutfi Sarhan RN[1]* and Heyam Ezat Anini RN[2]

[1]College of Nursing Science, Al-Ghad International Colleges for Applied Medical Sciences, Kingdom of Saudi Arabia

[2]Department of Mental health Nursing, School of Nursing, Capodistrian University of Athens, Greece

***Corresponding author:** Adnan Lutfi Sarhan RN, College of Nursing Science, Al-Ghad International Colleges for Applied Medical Sciences, Al-Madinah Al-Monawarah, Kingdom of Saudi Arabia. Tel: 966544143834; Fax: 96648224605; Email: abuibraheem2001@yahoo.com

Received: November 17, 2014; **Accepted:** January 05, 2015; **Published:** January 07, 2015

Abstract

Introduction: Preterm birth is the delivery of an infant before 37 weeks of gestation. It is a major public health problem. Prematurity is the leading cause of infant mortality and morbidity worldwide. The purpose of this study is to identify the risk factors of preterm birth and possible determinants among Palestinian women in the Northern part of the West Bank.

Methodology: A case control study of 100 cases of preterm delivery and 201 controls of full term delivery was carried out. The cases were taken from three governmental hospitals in the Northern West Bank. The data was analyzed by using Statistical Package of Social Sciences (SPSS) version 19. Frequencies, Chi-square and multiple regressions were done to explore the relation between the dependent variable (preterm birth) and the other independent variables. The study took six months starting from the first of May 2013 to the 31 of October 2013. Face to face interviews using a questionnaire were used.

Result: The results show that the main risk factors of preterm birth are the following: medical indication for pregnancy termination, (p= 0.001), (95% CI 0.328- 0.617); Preterm Premature Rupture of Membrane (PPROM), (p=0.006), (95% CI 0.079- 0.462); previous history of preterm delivery, (p=0.007), (95% CI 0.049- 0.309); and disorders associated with pregnancy, (p= 0 .015), (95%, CI 0.028-0.254t). Other risk factors identified by the study are the following: type of family, congenital gynecological problems, family history of preterm birth, previous delivery by Caesarean Section (CS), daily, vaginal bleeding during pregnancy, psychological problems, and height.

Conclusion: The main risk factors of preterm birth were multiple pregnancies, medical indications for preterm birth (mainly preeclampsia), placenta previa, abruption placenta, previous Caesarean Section, the presence of a disorder associated with pregnancy (mainly hypertensive disorder), preterm premature rupture of membrane, and a previous history of preterm birth.

Keywords: Pregnancy; Labour; Female; Premature birth; Preterm labour

Abbreviations

ABGAR: Appearance Pulse Grimace Activity Respiration; CS: Caesarean Section; IMR: Infant Mortality Rate; IPTB: Indicated Preterm Birth; IVF: Invetro- Fertilization; LMP: last Menstrual Period; NIS: New Israeli Shekel; PPROM: Preterm Premature Rupture Of Membrane; PTB: Preterm Birth; RDS: Respiratory Distress Syndrome; SPSS: Statistical Package of Social Sciences; SPTB: Spontaneous Preterm Birth; UTI: Urinary Tract Infection

Introduction

Background

Despite advances in prenatal medicine, the incidence of preterm labour continuous to increase [1]. In Palestine the preterm services developed in acceptable situation, but still the preterm care going to increase. Preterm labour continues to be one of the main causes of neonatal mortality and morbidity. It refers to labour with an onset before 37 weeks gestation. This is essentially an arbitrary lower cut-off for a 'term' pregnancy and there is clearly a big difference between labour at 27 weeks gestation and labour at 36 weeks and 6 days. From an epidemiological perspective it is possible to evaluate exposures (potential risk factors) and outcomes (morbidity or mortality) on a gestational week-by-week basis and this approach offers certain statistical advantages [2]. Most preterm babies have long life impairment and impose a significant economic burden on society [3]. Prematurity, whether examined by gestational age or birth weight is associated with significant neonatal cost, which is decreased with advancing gestational age. The total cost for each gestational age group from 25 – 36 weeks was $38 million in United States. The financial burden of the acute care of preterm infants has been estimated to be at least 26.2 billion per year also in United States [4]. Most of the risk factors for preterm birth are modifiable: socioeconomic, smoking, maternal stress, lack of prenatal care and iatrogenic preterm birth. So the identification of modifiable risk factors is an essential first step in any primary prevention program [3]. The basic mission in identifying risk factors is to improve the health of infants by preventing premature birth and decreasing infant mortality rates. By improving community services, education and undertaking advocacy lives can be saved.

The Palestinian community has an overall low socioeconomic

Citation: Adnan Lutfi Sarhan RN and Heyam Ezat Anini RN. Risk Factors of Preterm Birth among Palestinian Women: Case Control Study. Austin J Nurs Health Care. 2015;2(1): 1011.

standing [5]. Many Palestinians live below the poverty line and all live under occupation. These conditions make Palestinian women suffer from a lack of health services. Additionally, the number of neonatal units and incubators is not enough to accommodate the number of premature babies arriving daily in Palestine. Many preterm deliveries occur in hospitals without neonatal units, and the transferring process is difficult and time consuming due to the restriction of movement imposed by Israeli authorities. This affects the baby's condition and increases infant morbidity and mortality rates. Thus, preventing premature births in paramount in Palestine considering the existence of these additional factors of vulnerability. In order to be effective, preventative measures must be supported by high quality research in the Palestinian community. Researchers must be supported financially by the government and the Ministry of Health. The aim of this study is to identify the risk factors of preterm birth and possible determinants among Palestinian women in the Northern part of the West Bank.

Methods

Study design

The type of this study is a hospital-based comparative study by choosing one case and two controls with a ratio of 1:2. Cases were composed of the respondents who had (preterm delivery) and control respondents who had the condition (full term delivery).

Study population

The study population consisted of women who had recently given birth and their infants. For every premature delivery (a case) two full-term deliveries were taken as a control. For each premature baby (a case), two full term babies were chosen a control. Approximately 6,400 deliveries were enrolled in the study over six months. The distribution of deliveries was 2,885 from Rafidia Hospital; 1,040 deliveries from Al-Shaheed Thabet hospital and 2,482 deliveries from Al-Shaheed Ali hospital. The period of the study was six months. It started from the first of May 2013 to thirty-first of October 2013.

Criteria for inclusion of participants in the study

Inclusion criteria for cases

The inclusion criteria for cases were a live preterm birth during the period from the first of May 2013 to the thirty-first of October 2013. The gestational age inclusion criteria for cases were from 27 weeks to 36 weeks and 6 days according to the last Menstrual Period (L.M.P.). Gestational age was calculated by Nagles rule (L.M.P plus seven days to minus three months). The 27 weeks were used as a lower limit because the birth record registration in governmental hospitals is 27 weeks. The inclusion criterion for the control group was a full-term delivery, from 37 weeks of gestation to 41 weeks.

Exclusion criteria for cases and controls

Still birth, unknown L.M.P, less than 27 weeks of gestation for cases and more than 41 weeks of gestation for controls, and congenital abnormal babies.

Sampling process

Weekly visits to the three governmental hospitals were made. All cases of premature delivery presented at the hospital that day were taken as cases. Controls were chosen by taking the next two beds of full term delivery available at hospital. If they did not meet the inclusion criteria the next bed was taken.

Data collection process

Primary data were collected through highly structured interviews and questionnaires were filled by face to face interviews directly after delivery while the women were staying at the hospital. The researchers sat in front of the women, asked her the questions and ticked her answers. The questionnaire was prepared, organized and numbered with serial numbers, which were taken from a previous study done in the Gaza Strip. Necessary modifications for the questionnaire were done to be applicable for the current study and population. Also, the questionnaire was translated to Arabic language to be easier for use, and was designed around the risk factors of preterm birth; it contains seven parts. The first part contains personal information, the second part socioeconomic information, the third part contains past obstetrical and gynaecological information, the forth part contains current pregnancy information, the fifth part contains maternal physical information, the sixth part contains antenatal care information during pregnancy and the seventh part contains newborn information. Secondary data were taken from mothers' files and birth records. These data are: women's weight, height, and haemoglobin level before birth. Newborn information was taken from newborn files at the neonatal unit such as birth weight, Appearance Pulse Grimace Activity Respiration (ABGAR) score, and causes of admission to neonatal unit and period of admission.

Sample size

A convenient sample of 301 subjects was chosen, 100 cases and 201 controls. This sample size was chosen in limited number due to that the study was not funded which limited its results.

Reliability of the study

Reliable questionnaire with cronbach alpha 82%; was filled by face to face interviews with both cases and controls by the researcher. The questionnaire was used before in a study done in the Gaza Strip and checked for validity and reliability. A pilot study was done on 15 cases and ten controls to examine the internal consistency of the questionnaire by using test-retest reliability test. The necessary modifications of the questionnaire questions were done to be suitable for our population.

Statistical analysis

The data was analyzed by using (SPSS) version 19. Frequencies, Chi-square and multiple regressions were done to explore the relation between dependent variable (preterm birth) and the other independent variables.

Ethical considerations

A consent form was prepared on the first page of the questionnaire, and the participants' agreement requested. If the participant could not read, the consent was read to her by the researcher. Also, the permission from the Institution Review Board at An-Najah National University was taken.

Results

Introduction

A hospital-based case control study was conducted in three

governmental hospitals in three Palestinian cities at the Northern West Bank: Nablus, Jenin and Tulkarem. The study started on the first of May 2013 and ended on the 31st of October 2013. The aim of this study is to identify the risk factors of preterm birth among Palestinian women. Our anticipation from the study is that there were deferent risk factors for preterm birth. Preterm birth is mainly related to previous history of preterm delivery, family history, genitourinary tract infection, disorder caused by or associated with pregnancy such as pregnancy induced hypertension, preeclampsia and eclampsia, gyneobstetric conditions as uterine, cervical, and placental abnormalities as placenta previa and abruption placenta which are presented by massive ante partum haemorrhage that needs medical intervention and urgent caesarean section to save both mothers' and babies' lives. Chronic diseases associated with pregnancy like hypertension and diabetes were the most common causes of medically indicated preterm delivery. Additional preterm risk factors were multiple pregnancies, such as twins or triplets, who caused over distension of the uterus and resulted in preterm delivery, as well as maternal habits like smoking, and stressful life events. The aetiology of preterm delivery is multi factorial and the isolation of one factor from another is very difficult, and requires high quality research on the community.

Study findings

The main risk factors of preterm birth were found to be:

1- Previous history of preterm birth, (p= 0.007), (95% CI 0.049-0.300).

2- Preterm premature rupture of membrane (p= 0 .006), (95% CI 0.079- 0.462).

3- Medically indicated preterm birth (p= 0 .001), (95% CI 0.328-0.617).

4- Disorder associated with pregnancy (p= 0.015), (95% CI 0.028-0.254).

5- Multiple pregnancy such as twin, triplet, and quadruplet (p= 0.001), (95% CI 0.249- 0.581).

Table 1 contains main risk factors of preterm birth and Table 2 contains other risk factors. After analysis, five of these factors were found to be significant. Multiple pregnancy (p= 0.001), previous history of preterm birth (p=0.007), Preterm Premature rupture of membrane (p= 0.006), medical indications of preterm birth (p= 0.001) and a disorder associated with pregnancy (p= 0.0158).

After analyzing the socio demographic data (Table 3) the results show no relation between maternal age and preterm birth, 3% of cases were less than 18 years of age, 77% of cases were between 18 -34 years of age and 20% of cases were 35 or more years of age. Regarding place of delivery, approximately 68% of cases were from Rafidia Hospital, 19 % from Al-Shaheed Ali Hospital and 13% from Al-Shaheed Thabet Thabet Hospital. In terms of years of education of the women, 74% of cases and 66.1% of controls had a middle level of education (6-12) years, (p=0.334). 90% of cases and 80% of controls were from nuclear families, while 10% of cases and 19% of controls were from extended families, so the nuclear family is considered a risk factor for preterm birth (p= 0.030). Number of persons in family and number of rooms in the house showed no relation with preterm birth. Monthly income was also not found to be a significant risk factor; 33% of cases and 22.8% of controls had a low income (less than 1,000 NIS per month); 41% of cases and 51% of controls had a monthly income between 1,000 and 2,000 NIS and 24% of cases and 24.8% of controls had an income of more than 2,000 NIS per month. Total income percentage of less than 1,000 NIS was found to be 26.2% (p= 0.232).

Table 1: Multiple Regression of main risk factors of preterm birth.

Variable	B	SE	95% CI	p
Previous history of preterm delivery	0.179	0.066	0.049-0.300	0.007
Preterm rupture of membrane	0.270	0.097	0.079-0.462	0.006
Indication of pregnancy termination	0.472	0.073	0.328-0.617	0.001
Disorder caused by this pregnancy	-5.250E-02	0.065	0.028-0.254	0.015
Type of this pregnancy	0.415	0.084	0.249-0.581	0. 01

Age of marriage was not found to be a significant risk factor (p=0.988). Also, the number of pregnancies (Gravida), deliveries (Para), and abortions showed no significant relationship with preterm birth (p=0.246).

Previous history of preterm birth was found to be a significant risk factor for preterm birth, (p=0.001), and also family history (p=0.003). Recurrent vaginal infection (p=0.016), congenital gynaecological problems (p=0.014), and cervical cerclage (p=0.001) were significant risk factors. In contrast, UTI was not found to be a significant risk factor for preterm birth (p=0.095. Most gyneobstetric conditions were found to be significant risk factors for preterm birth, for example, a previous delivery by CS (p= 0.018). How pregnancy happened, spontaneously or with medical intervention, was not found to be a significant risk factor. The pregnancy of 90% of cases and 96% of controls happened spontaneously, (p=0.072). Placental problems like placenta previa and abruption placenta were found to be significant risk factors for preterm birth, (p=0.001). Indication for pregnancy termination was found to be a significant risk factor (p=0.001). These indications were: preeclampsia and eclampsia (18%), diabetes (3%), and anti partum haemorrhage (28%). Also, vaginal bleeding during pregnancy was found to be a significant risk factor, especially mid trimester vaginal bleeding, (p=0.001).

Disorders caused by pregnancy were found to be significant risk factors for preterm birth (p=0.001). These disorders were: pregnancy induced by hypertension, which was responsible for 22% of preterm births, gestational diabetes (4%) and other factors (5%).

Disorder associated with preterm birth was found to be a significant risk factor for preterm birth. (p=0.001). These disorders were divided among cases like: Urinary Tract Infection (UTI) (9%), vaginal infection (7%), anaemia (9%), renal disease (4%), and other (3%). There is an association between psychological problems and preterm birth (p= 0.04). The only physical characteristic found to be a significant risk factor was maternal height less than 150 cm (p= 0.012). Maternal level of haemoglobin shows no relation with preterm birth (p=1.00). Maternal weight was not found to be significant (p=0.329); 16% of cases' weight was less than 60 kg and 9.4% of controls, 59% of cases' weight was more than 70 kg and 57% of controls.

Maternal smoking was not significant risk factor for preterm birth (p=0.113).

Table 2: Complementary risk factors of preterm birth.

Variable	Case (%)	Control (%)	Total (%)	P-value	Variable	Case (%)	Control (%)	Total (%)	P-value
Congenital gynecological problems					Delivered baby with congenital abnormalities				
Yes	13(13)	10(5.97)	23(7.6)	0.014	Yes	8(8)	10(4.8)	18(5.9)	0.297
No	87(87)	191(95)	278(92.4)		No	92(92)	191(95.2	283(94.1)	
History of cervical cerclage					Previous delivery by CS				
Yes	13(13)	5(2.5)	18(6)	Fisher extract 0.001	Yes	38(38)	50(24.8)	88(29.2)	0.018
No	87(87)	196(97.5)	283(94)		No	62(62)	151(75.2)	213(70.8)	
Recurrent vaginal infection					Placental problems during this pregnancy				
Yes	55(55)	81(40.2	136(45.1)	0.016	Yes	16(16)	2(0.9)	18(5.9)	0.001
No	45(45)	120(59.8)	165(54.9)		No	84(84)	199(99.1)	283(94.1)	
History of UTI					Vaginal bleeding during pregnancy				
Yes	55(55)	90(44.7)	145(48.2)	0.095	Yes	25(25)	17(8.5)	42(14.0)	0.001
No	45(45)	111(55.3)	156(51.8)		No	75(75)	184(91.5)	259(86.0)	
Previous History of preterm delivery					psychological problems during pregnancy				
Yes	26(26)	16(7.9)	42(13.9)	0.0001	Yes	23(23)	28(13.9)	51(16.9)	0.04
No	74(74)	185(92.1)	259(86.1)		No	77(77)	173(86.1)	250(83.1)	
Family history of preterm delivery					Height in centimetre of the mother				
Yes	19(19)	17(8.5)	36(12)	0.003	<150	4(4)	0.0(0)	4(1.4)	0.02
No	79(79)	184(91.5)	263(88)		>150	96(96)	201(100)	297(98.6)	
History of still birth					WT of the mother(kg)				
Yes	10(10)	22(11)	32(10.6)	0.802	<60	16(16)	19(9.4)	35(11.6)	0.329
No	90(90)	179(89)	269(89.4)		60-70	24(24)	67(33.3)	91(30.2)	
					>70	59(59)	115(57.3)	174(58.2)	
Hemoglobin level					Age at marriage				
<11	40(40)	79(39.4)	119(39.5)	1.00	<18	28(28)	58(29))	86(28.7)	0.988
>11	60(60)	122(60.6)	182(60.5)		18-25	65(65)	129(64.1)	194(64.4)	
Smoking cigarettes					>25	7(7)	14(6.9)	21(6.9)	
Yes	7(7)	5(2.5)	12(3.98)	Fisher exact 0.113	Birth interval				
No	93(93)	196(97)	289(96)		No	30(30)	44(21.8)	74(24.9)	0.484
Gravida					<6 months	3(3)	9(4.4)	12(4)	
1-3	48(48)	112(55.7)	160(53.1)	0.246	6-12m	16(16)	39(19.4)	55(18.7)	
4-6	31(31)	61(30.3)	92(30.7)		12-18m	15(15)	40(20)	55(18.7)	
>6	21(21)	28(13)	49(16.2)		>18m	33(33)	69(34)	102(33.7)	
pregnancy happened				0.072	Type of this pregnancy				0.001
spontaneously	90(90)	193(96)	283(94)		Single	84(84)	195(97)	279(92.6)	
With medical intervention	10(10)	8(4.0)	17(5.6)		Twins or triplete	16(16)	6(3)	22(7.4)	

Summary of the study findings

Socio demographic data show no relation between maternal age and preterm birth nor was the age at marriage and age at first delivery found to be a significant variable. Place of delivery shows no significant correlation (p 0.334). Type of family showed that nuclear families were considered to be a risk factor (p=0.030). Number of persons in family and number of rooms in the house showed no relation with preterm birth. Monthly income was also found to be not significant (p=0.232).

Previous obstetric history showed that the number of pregnancies (gravida), of deliveries (Para), and abortions showed no significant relationship with preterm birth.

Birth interval between the last two pregnancies was not found to be a risk factor for preterm birth (p=0.484).

Congenital gynaecological problems of uterus or cervix have a relationship with preterm birth (p= 0.014), and history of cervical cerclage also has a relation (p=0.01). Recurrent infection of vagina or cervix have a relation (p=0.016), while presence of urinary tract infection shows no relation (p=0.095). Previous history of preterm birth has a significant relationship (p=0.001). Family history of preterm birth has a relation with preterm birth (p=0.003). History of still birth and history of delivery of a baby with congenital

Table 3: Risk of socio demographic factors on preterm birth.

Variable	Case(n) %	Control (n) %	Total (n)	Total %	P
Age in years					
<18	3	2 (0.9)	5	1.6	0.437
18-25	37	90 (44.7)	127	42.1	
26-34	40	78 (38.8)	118	39.2	
35-40	17	28 (13.9)	45	14.9	
41-45	3	3 (1.4)	6	1.9	
Total	100	201	301		
Place of delivery					
Rafedia	68	135 (67)	203	67.4	0.501
Tulkarm	13	19 (9.4)	32	10.6	
Jenine	19	47 (23)	66	21.9	
Years of education					
<6 years	3	11 (5.4)	14	4.6	0.334
6-12	74	133 (66.1)	207	68.7	
>12	23	57 (28.3)	80	26.5	
Type of family					
Nuclear	90	161 (80)	251	83.0	0.030
Extended	10	40 (19.9)	50	16.6	
No. of rooms in the house					
1	8	14 (6.96)	22	7.3	0.920
2-3	57	113 (56.2)	170	56.47	
>3	35	74 (36.8)	109	36.2	
No. of persons living in the house					
2-3	23	34 (16.9)	57	18.9	0.821
4-6	41	100 (49.75)	141	46.8	
>6	36	67 (33.3)	103	34.2	
Monthly income(NIS)					
<1000	33	46 (22.8)	79	26.2	
1000-1500	27	59 (29.3)	86	28.5	0.232
1600-2000	16	46 (22.88)	62	20.5	
>2000	24	50 (24.8)	74	24.58	

abnormalities were not found to be significant. Previous delivery by CS was found to be a risk factor (p=0.018). How pregnancy happened (spontaneously or with medical intervention) was found to be not significant (p=0.072). Also placental problems, placenta previa and abruption placenta were found to be risk factors for preterm birth (p=0.001). Indication for pregnancy termination was found to be a significant risk factor (p=0.001), mainly due to eclampsia and preeclampsia. Vaginal bleeding during pregnancy was found to be a risk factor for preterm birth (p=0.001). Also, disorders associated with pregnancy (p=0.001) and disorders caused by pregnancy were found to be risk factors for preterm birth (p=0.001). Psychological problems during pregnancy were found to be significant risk factor (p=0.04). Maternal height of less than 150 cm was found to be a risk factor for preterm birth (p=0.012).

Discussion

Introduction

Risk factors of preterm birth are multi factorial. The risk of preterm birth is increased when a combination of two or more factors is present [6].

Many risk factors of preterm birth were identified by this study. These risk factors were: living with a nuclear family, having a previous history of preterm birth, having a family history of preterm birth, having a previous delivery by CS, having a multiple pregnancy,

having a congenital gynaecological problem in the cervix, uterus and placental problems, maternal smoking, vaginal infection, Preterm Premature Rupture of Membrane (PPROM), vaginal bleeding during pregnancy, medically indicated PTB, disorder caused by pregnancy mainly hypertensive disorder, disorder associated with pregnancy such as Genitourinary tract infection, Diabetes, and renal disease. Also, psychological problems during current pregnancy, height, and mode of delivery by CS all had an effect on the occurrence of preterm labour.

Discussion of the socio demographic factors in relation to preterm birth

Age: This study shows that there is no significant relationship between age and preterm birth (p=0.437), and the age of marriage and age of first delivery were not found to be significant. Although [7] found in their study in the Gaza Strip that a maternal age of 35 years or older was a significant risk factor. Also, [8] found that a risk factor for preterm birth was a maternal age below 18 years. The age of marriage in West Bank has increased in recent years [5], so teenage pregnancy rates have decreased. Also, we can see that our sample age above 18 years constitute about 72% of the study sample, which indicates that the West Bank population differs from other population studies.

Family Income: Family income and household factors were not found to be significant risk factors for preterm birth. Although in Brazil, family income is equal to or less than minimum wage/month, delivery at a public hospital is a risk factor of preterm birth [8].

[9] Found that the main determinant of preterm birth in Iraq was low socioeconomic status. Socioeconomic data in this study was income, number of persons and number of rooms in the house shows no significant relationship with preterm birth. The possible cause of this is that the study was carried out at public hospitals, where the women are from the same socioeconomic class with no social disparities. The income of 33% of cases and 22.8% of controls was less than 1,000 NIS per month, which is considered below the poverty line. At the same time, both cases and control had nearly the same household characteristics.

Level of Education: Level of education in this study was not found to be a significant risk factor. 3% of cases and 5.4% of controls had a level of education less than 6 years. Also, 74% of cases and 66.1% controls had a middle level of education (6-12 years). In contrast with our study, a cohort study done about large social disparities and spontaneous preterm birth in transitional Russia found an increased risk of preterm delivery in women with lower levels of education and stress [10].

Type of Family: The only significant social risk factor found in this study is living with a nuclear family, (p=0.030). The interpretation of this result is that the Palestinian society is moving towards a nuclear family with a loss of psychological and social support which exists in the extended family household. Thus, psychological problems during current pregnancy were found to be a significant risk factor in this study. Maternal stress modulates the women susceptibility to preterm labour, maternal stress may act via neuro-endocrine pathway that activates the maternal –placental – foetal endocrine system. Scandinavian studies suggest an association between maternal stress life event and preterm delivery [2]. Stress becomes more significant when it is combined with other risk factors like infection, and substance abuse such as smoking, alcohol and drug addiction.

Discussion of Reproductive Factors Affecting Preterm Birth: Gravidity, parity, and the number of abortions were not found to be significant risk factors of preterm birth in our study [8]. In Brazil found in their study that prim parity is a risk factor of preterm birth. The interval between the last two pregnancies was not found to be a significant risk factor for preterm birth [11]. found in the United Arab Emirates that the inter pregnancy interval risk factor is causal and its modification would reduce the risk of preterm birth. The difference between our study and other studies may refer to the strong family planning programs in Palestine which made the study sample to be at the same level in relation to Gravidity, parity, and number of abortions.

Discussion of the current pregnancy factors in relation to preterm birth

Previous History of Preterm Birth: Previous history of preterm birth was found to be a significant risk factor in our study; (p= 0.007). Women who had a Spontaneous Preterm Birth (SPTB) were more likely to have had a spontaneous preterm birth in the previous pregnancy while women with Indicated Preterm Birth (IPTB) were significantly more likely to have had a previous indicated preterm birth, so SPTB and IPTB are strongly repetitive [12]. Prior preterm birth is identified as a risk factor of preterm birth among Taiwanese women, and also among Palestinian women in the Gaza Strip. Previous preterm birth was found to be significant risk factor in many studies about risk factors.

Family History of Preterm Birth: Family history of preterm delivery was found to be a significant risk factor (p=0.003). 19% of cases had a family history of preterm birth and 8.45% of controls. Preterm birth results from a complex mix of genetic susceptibility, environmental factors and behaviours [13]. Found that sisters and other family members of women who had delivered preterm had a high risk of early delivery. Similarly, there was an increased risk among women whose mothers had been born in premature delivery than woman without a similar family history.

[14] Found that the risk factors for spontaneous preterm birth were a previous preterm birth and consanguinity. Genetic studies have recently begun to elucidate the role of genetic variant in preterm birth. A study done among Caucasian women supports the hypothesis that mitochondrial genome polymorphisms may play a significant role in preterm birth through interaction with smoking [15]. Researchers do not know precisely how genes may influence preterm risk, and genes that regulate the condition of the uterus during pregnancy. More studies are needed to pinpoint which genes play a role in preterm delivery.

History of Still Birth and of Congenital Abnormal Baby: History of still birth was not found to be a significant risk factor for preterm birth, (p=0.802), but in the Gaza Strip it was found to be significant risk factor. This result can be interpreted that the Infant Mortality Rate (IMR) in 2011 in the West Bank was lower than the IMR in the Gaza Strip at that time.

Also, a history of delivery of a baby with congenital abnormalities was not found to be a significant risk factor (p=0.297). These results

may indicate that the development of high technology in identifying the congenital problems for infants can decrease the delivery of an abnormal baby.

Congenital Gynaecological Problems in Relation to Preterm Birth: Presence of congenital gynaecological problems like bicorneated uterus and cervical incompetence, and a narrow pelvis were found to be significant risk factors (p=0.014). In these conditions sometimes emergency delivery happens in the absence of labour pain or any warning sign, which is more dangerous because we cannot stop or delay delivery through the administration of corticosteroid therapy, so premature babies in this category have a high mortality and morbidity due to respiratory problems and intracranial haemorrhage.

Also, the presence of a history of cervical cerclage was found to be a significant risk factor (Fisher 0.001). This means that cervical problems like cervical incompetence are a risk factor for preterm birth. Cervical cerclage was found to be helpful for women with a short cervix and a history of preterm birth [16]. At the same time, cervical surgery is considered a risk factor for preterm birth through the risk of infection [7]. found in their study in the Gaza Strip that the presence of congenital gynaecological abnormalities is a risk factor for preterm birth.

Genito- Urinary Tract Infection: Recurrent vaginal and cervical infection was found to be a significant risk factor for preterm birth (p= 0.016). Many studies have confirmed associations between genital tract infection and preterm labour. Epidemiological studies in the USA suggested that two factors: maternal stress and maternal urogenital tract infection are significantly and independently associated with an increased risk of spontaneous preterm birth [17].

Urinary tract infection was found to be not a significant risk factor of preterm birth (p=0.095). But it has high incidence; the percentage of UTI on cases and control was 55% and 44% respectively. Also, [9] found that urinary tract infection is a significant risk factor for preterm birth. Because our study does not stress the variable of UTI only and the pregnant women were not followed precisely for the development of UTI, we did not find a clear correlation between it and preterm birth.

Risk of gyneobstetric history in relation to PTB

How pregnancy happened?

Pregnancy happened spontaneously in 90% of cases and 96% of controls. Only in 9% of cases and 3.9 % of controls did pregnancy happen with medical interventions like Invetro- Fertilization (IVF) or hormonal therapy. It is found to be not a significant risk factor in this study (p=0.072). The risk of preterm birth increased in pregnancies which happened with medical interventions like IVF through the risk of multiple gestations. So this is considered an acceptable result regarding artificial pregnancy.

Preterm Premature Rupture of Membrane (PPROM)

Preterm premature rupture of membrane (PPROM) has been found to be a significant risk factor (p= 0.006); it contributes to about 29% of cases and 18.9% of controls from preterm birth in this study [18]. Concluded in their study that the presence of rupture membrane was the best predictor of preterm birth within 48 hours.

The long interval between rupture membrane and delivery increased the risk of microbial invasion of the amniotic cavity. Recurrent vaginal and cervical infection was found to be significant risk factors in this study (Fisher exact test 0.001). Inflammation is associated with higher incidence of preterm birth, and data supported an association between infection, inflammation, and cerebral palsy [19].

Smoking and Preterm Birth

Maternal smoking in general was not found to be significant (P=0.113), but smoking of more than 10 cigarettes daily was found to be a significant risk factor among Palestinian women (p=0.04). But the response rate for this question was little fore that we found that maternal smoking in general was not found to have significant relation with preterm delivery.

The impact of maternal smoking on every preterm birth appears to be complex and it is increased with the amount of smoking. The highest impact was seen among women who smoked at least 10 cigarette/day [20]. The percentage of smoking in the West Bank increased by 7%; 38.4% of smoker are males and 3.0% are females while the percentage of smoking among females in the Gaza Strip is 0.5% [5].

However, smoking is not found to be a significant risk factor of preterm birth in the Gaza Strip. A study done in Ain Shams University found that smoking, whether active or passive is a significant risk factor for preterm birth [21]. We can see that the difference in the percentages of women who smoke between the West bank and the Gaza Strip can affect its correlation in the resulted preterm birth.

Medical Interventions and Preterm Birth

Medically indicated preterm birth is found to be a significant risk factor (p=0.001). It is referred to as planned preterm birth with CS or induction of labour, and it is used to describe circumstances were preterm birth is preferred management [2]. These indications for pregnancy termination are: diabetes 3%, eclampsia and preeclampsia, which are responsible for 18% of cases. Anti partum haemorrhage is responsible for 28% of cases, and mainly due to placenta previa and abruption placenta. A placental problem was found to be a significant risk factor (p=0.001) [22]. Conducted a retrospective cohort study in Missouri that found that the maternal–fetal condition that necessitated iatrogenic preterm delivery included preeclampsia, placenta abruption, placenta previa, unexplained vaginal bleeding, pre gestation and gestational diabetes. Previous delivery by CS was found to be significant risk factor for PTB (p=0.018).

Multiple Pregnancy and Preterm Birth

Preterm birth and multiple pregnancies were found to have a positive effect on preterm birth (twins, triplets, and quadruplets) (p=0.001). Twin pregnancies carry a high risk of spontaneous preterm birth compared with singleton pregnancies [23].

The result of Norman is consistent with our results because multiple pregnancies cause over distension of the uterus and decreased levels of progesterone, which may lead to preterm labour, male presentation which indicates caesarean section. Risk factors of preterm birth overlap each other and it is difficult to isolate one factor from another.

Maternal Physical Characteristics in Relation to Preterm Birth (height and weight)

The relationship of short maternal height and low maternal

weight with risk of preterm birth is not clear; our study shows a small increasing risk of short stature; the risk of maternal height of less than 150 cm can be a significant factor for preterm birth (p=0.012).

Maternal weight was not found to be significant, although [24] found that the risk of spontaneous preterm birth increased by 60% in women with a low rate of weight gain. Also, [7] found in their study in the Gaza Strip that failure to gain weight during pregnancy is considered to be a risk factor for preterm birth.

Maternal Level of Haemoglobin

Maternal level of haemoglobin was found to be not a significant risk factor (p=1.0) in our study but in another study they found that anaemia was found to be a significant risk factor of preterm birth among the Egyptian population [21].

Limitations of the study

The researchers met many obstacles during data collection. First, difficulty in catching the cases because the time clients staying at hospital was very short, they were discharged from hospital few hours after delivery. Second, sometimes cases and controls presented at hospital not meeting the study criteria, some data were not registered in the medical records. Finally it is worth to mention that closure of neonatal unit in Jenin on August was done due to septicaemia and premature cases were referred to Rafidia hospital, so these conditions resulted in an increase number of cases and controls taken from Rafedia hospital.

Conclusion and implications of the study

The main risk factors of preterm birth in this study were: previous history of preterm birth, Preterm Premature Rupture of Membrane (PPROM), medically indicated preterm birth, disorders associated with pregnancy (mainly hypertensive disorders), and multiple pregnancy. These implications can guide our nursing practice toward increasing health education starting from the schools, to outpatient clinics, and finally during pregnancy and antenatal period. Data collected in this study show that there is a need to accurately establish the rate of preterm birth, put lower limit and upper limit for the definition of preterm birth ,and more accurate way to estimate the gestational age . Also there is need for better understanding of the aetiology of preterm birth such understanding brings benefit in term of health and health economics.

References

1. Simchen MJ, Dulitzky M, Mashiach S, Schiff E. Does preterm cervical dilatation imply imminent labor in multifetal pregnancies? Eur J Obstet Gynecol Reprod Biol. 2002; 103: 119-121.
2. Murphy DJ. Epidemiology and environmental factors in preterm labour. Best Pract Res Clin Obstet Gynaecol. 2007; 21: 773-789.
3. Berkowitz GS, Papiernik E. Epidemiology of preterm birth. Epidemiol Rev. 1993; 15: 414-443.
4. Gilbert WM, Nesbitt TS, Danielsen B. The cost of prematurity: quantification by gestational age and birth weight. Obstet Gynecol. 2003; 102: 488-492.
5. Statistics PCBo: Palestine in Figures 2011. In. Ramallah – Palestine. 2012.
6. Fathi A: Maternal Risk Factors Associated with low birth weight in Gaza Strip. Unpublished thesis 2002.
7. Abu Hamad Kh, Abed Y, Abu Hamad B. Risk factors associated with preterm birth in the Gaza Strip: hospital-based case-control study. East Mediterr Health J. 2007; 13: 1132-1141.
8. Aragao VM, da Silva AA, de Aragão LF, Barbieri MA, Bettiol H, Coimbra LC, et al. Risk factors for preterm births in Sao Luis, Maranhao, Brazil. Cad Saude Publica. 2004; 20: 57-63.
9. Al-Dabbagh SA, Al-Taee WY. Risk factors for pre-term birth in Iraq: a case-control study. BMC Pregnancy Childbirth. 2006; 6: 13.
10. Grjibovski AM, Bygren LO, Yngve A, Sjöström M. Large social disparities in spontaneous preterm birth rates in transitional Russia. Public Health. 2005; 119: 77-86.
11. Al-Jasmi F, Al-Mansoor F, Alsheiba 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: 871-875.
12. Ehrenberg HM, Iams JD, Goldenberg RL, Newman RB, Weiner SJ, Sibai BM, et al. Maternal obesity, uterine activity, and the risk of spontaneous preterm birth. Obstet Gynecol. 2009; 113: 48-52.
13. Plunkett J, Muglia LJ. Genetic contributions to preterm birth: implications from epidemiological and genetic association studies. Ann Med. 2008; 40: 167-195.
14. al-Eissa YA, Ba'Aqeel HS. Risk factors for spontaneous preterm birth in a Saudi population. Eur J Obstet Gynecol Reprod Biol. 1994; 57: 19-24.
15. Fortunato SJ, Menon R, Velez DR, Thorsen P, Williams SM. Racial disparity in maternal-fetal genetic epistasis in spontaneous preterm birth. Am J Obstet Gynecol. 2008; 198: 666.
16. Berghella V, Odibo AO, To MS, Rust OA, Althuisius SM. Cerclage for short cervix on ultrasonography: meta-analysis of trials using individual patient-level data. Obstet Gynecol. 2005; 106: 181-189.
17. Lumley J. Defining the problem: the epidemiology of preterm birth. BJOG. 2003; 110: 3-7.
18. Heitmann EM M. Utility of Umbilical Artery Doppler in Preterm Premature Rupture of Membranes. UMKC posters 2013.
19. Tita AT, Andrews WW. Diagnosis and management of clinical chorioamnionitis. Clin Perinatol. 2010; 37: 339-354.
20. Kyrklund-Blomberg NB, Cnattingius S. Preterm birth and maternal smoking: risks related to gestational age and onset of delivery. Am J Obstet Gynecol. 1998; 179: 1051-1055.
21. Fahim HI, Abdel Maeboud KH, Ashour HA, el-Makhzangy MN. A study of the epidemiology of preterm labor. J Egypt Public Health Assoc. 1992; 67: 341-355.
22. August EM, Salihu HM, Weldeselasse H, Biroscak BJ, Mbah AK, Alio AP. Infant mortality and subsequent risk of stillbirth: a retrospective cohort study. BJOG. 2011; 118: 1636-1645.
23. Norman A. Obstetric and the Newborn, second edition. 1986.
24. Abrams B, Newman V, Key T, Parker J. Maternal weight gain and preterm delivery. Obstet Gynecol. 1989; 74: 577-583.

Austin J Nurs Health Care - Volume 2 Issue 1 - 2015
ISSN : 2375-2483 | www.austinpublishinggroup.com

Citation: Adnan Lutfi Sarhan RN and Heyam Ezat Anini RN. Risk Factors of Preterm Birth among Palestinian Women: Case Control Study. Austin J Nurs Health Care. 2015;2(1): 1011.