Study of preterm births and risk factors among Libyan women

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Abstract: Preterm birth (PTB) is a major clinical problem associated with prenatal mortality and morbidity. The aim of the present study is to identify risk factors associated with PTB in Zawia city, Libya. A case-control study was conducted in Zawia teaching hospital, from January to June, 2010 with total of 75 cases of PTB and 75 controls of full-term births were screened and enrolled in the study. Multiple logistic regression model relate to preterm birth with factors can be predicted by maternal age, multiple gestation, previous preterm birth, hypertension and urinary tract infection. In this study, it was found that preterm birth is more likely to occur with increasing maternal age ≥ 35 years than other groups (OR = 6.3, CI 95%, 1.5-26.6, p = 0.01). In this model, logistic regression was showing increasing risk of preterm with multiple pregnancy (OR = 8.5, CI 95%, 2.03-35.24, p = 0.001). Previous preterm was represented an important predictor with developing preterm birth (OR = 1.13, CI 95%, 1.06-1.20, p < 0.0001). Moreover, hypertension was also found predictor for preterm birth (OR = 1.09, CI 95%, 1.01-1.17, p = 0.01). Finally, it is almost the same as with urinary tract infection. It is concluded that the main determinants of PTB in Libya were urinary tract infections, hypertension, in addition to poor obstetric history.

Introduction

Preterm birth (PTB) is a major determinant of neonatal mortality, morbidity and childhood disability and remains one of the most serious problems in obstetrics (1). PTB is defined as gestational age at birth of less than 37 completed gestational weeks (2). Globally, it is further classified into three main categories: mild, very preterm and extremely preterm for births occurring at 32-36 weeks, 31-28 weeks and less than 28 weeks respectively, with average frequencies of 85%, 10% and 5% respectively (3). Worldwide prematurity accounts for 10% of neonatal mortality, or around 500,000 deaths per year (4). Despite major preventive efforts, the incidence of PTB has remained constant at about 5-10% of live births in most countries over the past two decades (5).

The risk for preterm birth varies depending on previous obstetric history, socio-economic status and women's demographic and morphologic characteristics (9).

In 75% of PTB cases, no obvious causes have been established, but a number of risk factors have been identified that are linked to a higher risk of a preterm birth (10). Non-obstetric risk factors include low socio-economic status, low education level (11) as well as age at the upper and lower end of the reproductive years be it less than 20 years and more than 35 years of age (12). Obstetric risk factors associated with PTB include: short birth intervals as women with such as 6 months span or less between pregnancies have two-fold increase in preterm birth (14). Multiple pregnancies (twins, triplets) are significant factor in preterm birth. Women with a

previous preterm birth are at higher risk for a recurrence at a rate of 15-50% depending on number of previous events and their timing (18). A number of maternal medical conditions are associated with an increased risk of indicated or spontaneous preterm birth, including, for example, chronic hypertension, pre-pregnancy diabetes mellitus, and systemic lupus erythematosus. Maternal illnesses can alter or limit the placental delivery of oxygen and nutrients to the developing fetus, possibly resulting in fetal growth restriction.

In addition, they can increase the risk of preeclampsia and, thus, the risk of indicated preterm birth. Therefore, acute maternal medical conditions might lead to preterm birth (27). A number of other medical conditions have also been associated with PTB including urinary and genital tract infections and psychological stress (16).

Materials and methods

The research was conducted in Zawia Hospital, Zawia City**,** Libya and subjects are selected from maternity unit within hospital during the study period from January to June 2010. Samples were selected using simple random sampling based on the list of women who delivered in Zawia Hospital between January to June 2010. Cases are defined as pregnant women with a live preterm birth (between 22 and 36 weeks) by vaginal delivery or caesarean section. Controls are defined as pregnant women admitted to the same hospitals with full term live birth after 37 completed weeks. Recruitment of subjects will take in to account the inclusion and exclusion criteria. The inclusion criteria will involve number of weeks of gestation for each pregnant woman. Classification of groups will be based on the obstetric estimation of gestational age derived from three measures which include:

1. Per vaginal examination,
2. Ultra sound examination,
3. Last menstrual period,
4. Clinical neonatal estimation.

Therefore, the preterm birth defined as between 22 and 36 completed weeks of gestation. Exclusion criteria:
Babies delivered less than 22 weeks are considered abortion. in non Libyan citizen.

The sample size was calculated using power and sample size program soft-ware, with prevalence of preterm 15% from previous studies (in Libya at 1995 and from neighborhood country Egypt at 2005). (Incidence and risk factors of prematurely in Cairo, Egyptian: 2005 JABMS, 3(l):100-103)

$$M = 1, p = 0.15$$

Significant level at 0.05, power = 0.8, ratio case to control is 1:1**;** the sample size calculated was 75 respondents per arm. So, the total respondents are 150 subjects to be taken for this study. Permission for this study was taken from Zawia hospital authority. It is got an oral and written permission from the manager of the hospital during preparation of this proposal and it was welcomed to do this study. Approval from Research and Ethical committee Faculty of Medicine UKM Since 5-April-2010 and project code ff-113-2010. Data collection and measure-ment procedures:
a) Secondary data were collected from medical ward records.
b) Questionnaire was used to extract the information on the variables that are being studied, which was done by the researcher herself.

c) A set of questionnaire used to collect information from the respondents, which consist of two parts: The first part of the questionnaire will be on Socio-demographic data and the second part of the questionnaire will be on the obstetric history complication of pregnancy and delivery.

Statistical Analysis: Data entry and analysis were performed with using statistical package for social sciences (SPSS) version 19. Demographic data were summarized using descriptive statistic. Comparison between mean values of qualitative and quantitative data by both bivariate and multivariate analysis. For bivariate analysis, Chi square and Mann Whitney U test were used. The odds ratio was obtained by using risk from crosstabs. For adjusted odds ratio, logistic regression was performed to control for possible confounders. Information bias because are based on questionnaire and some of the variables is missing. Some variables cannot be measured due to logistic and technical facilities. The test of significance was considered when $p < 0.05$.

Results

The study was successfully conducted in the selected hospital. With a good response rate as compared to other previous studies. The study power was 80%. A total of 150 patients were recruited for this study. Seventy-five of them were patients having Preterm births from Zawia teaching hospital in Zawia city and another 75 patients who were having full term births and recruited as control from the maternal ward of the same hospital. The findings of the present data are presented under the following headlines:

Descriptive statistics:
Socio-demographic profiles {maternal age}, socio-economic background, reproductive history profile, past medical history profile.

Bivariate analysis:
Socio-demographic profiles {maternal age}, socio-economic background, reproductive history profile, past medical history profile.

1. Descriptive Statistics

1.1 Socio-demographic profiles (Maternal Age)

Table 1.1: Descriptive of Socio-demographic factors (maternal age)

Age groups (years)	Cases, n (%)	Control, n (%)	Total
20-24	10 (13.3%)	34 (45.3%)	44 (29.3%)
25-29	32 (42.7%)	29 (38.7%)	61 (40.7%)
≥ 35	33 (44.0%)	12 (16.0%)	45 (30.0%)
All ages	75 (50.0%)	75 (50.0%)	150 (100%)

The age was divided to three groups age 20-24, age 25-29 and ≥ 35) with frequency (%) of 22 (14.7%), 61 (40.7%) and 67 (44.7%) respectively.
For group (age ≥ 35) such cases represented for 33 (44%) and 12 (16%) represented the control. On the other hand, for group (< 20), it was 0 (0%) for both cases and control as no cases included in this is age group for this study.

Bar Chart of Socio-demographic factors (maternal age)

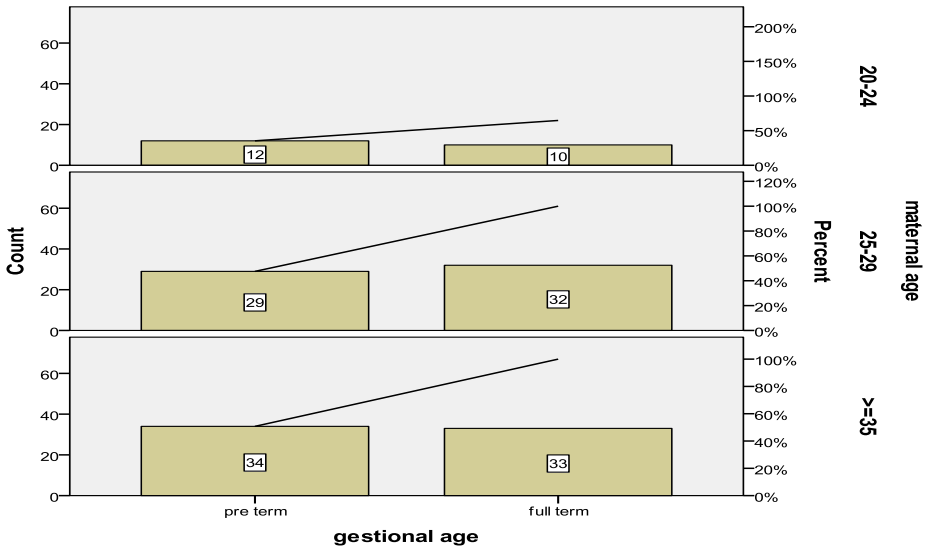


Figure 1.1: Maternal age groups (total) for both preterm and full term.

1. 2: Socio-economic background

Table1. 2: Descriptive of cases and controls according to socio-economic background

Variables	**Cases n (%)**	**Control n (%)**	**Total n (%)**
1 . Level of education			
Primary school	4 (5.3%)	0 (00%)	4 (2.7%)
Secondary school	26 (34.7%)	21 (28 %)	47 (31.3%)
University/college	45 (60 %)	54 (72 %)	99 (66%)
No formal education	0	0	0 (0%)
Total	75 (50%)	75 (50%)	150 (100%)
2 . Occupation			
Professional	11 (14.7%)	20 (26.7%)	21 (14%)
Supporting staff	43 (57.3%)	22 (29.3%)	65 (43.3%)
House wife	21 (28%)	33 (44%)	54 (36%)
Total	75 (50%)	75 (50%)	150 (100%)
3. Socio-economic status (Income)			
Low (200-300)	48 (64%)	38(50.7%)	86(57.3%)
Moderate – High (400-500)	27(36%)	37(49.3%)	64(42.7%)
Total	75(50%)	75(50%)	150(100%)

1. Level of education:

Most of the respondents (66%) had attended university/college (higher level of education). In addition, higher educated group has a high proportion among control group compared to the proportion among cases, 72% to 60%, respectively. More, female who cannot read and write was not reported in both groups for this study.

Bar Chart level of education

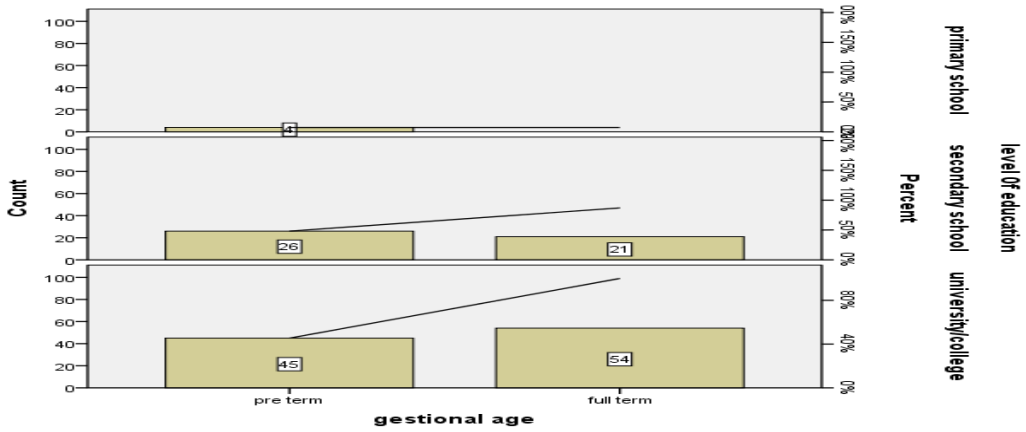


Figure 1.2: Level of education groups with preterm and full term birth

2. Occupation:

Most of the respondents from cases were supporting staff 43 (57.3%) compared with 22 (29.3%) on the other arm (control). On other hand, majority of control women are house wife 33 (44%) compared to 21 (28%) cases.

3. Socio-economic status (Income):

Income has divided into two groups (low from 200-300 Dinners or less) and moderate to high 400-500 Dinners with Libyan currency. There was difference between cases and control within group of (low) which was the rate among cases higher than among control 64-36% respectively. By contrast, in group of (moderate to high) the rate was almost the same between both groups.

3. Bar Chart of Socio-economic status (Income)

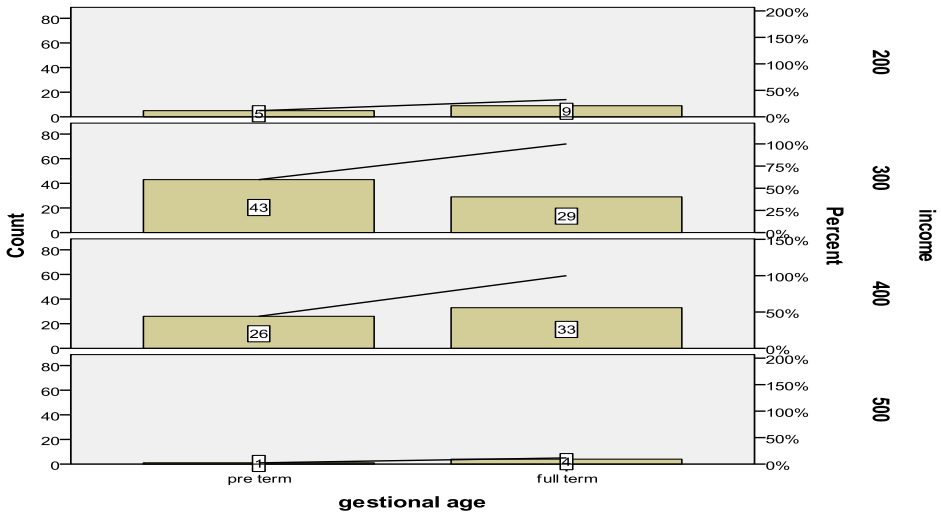


Figure 3: Income with preterm birth

1.3 Reproductive history profile

Table 1.3: Descriptive of study population according to reproductive risk factors.

Variables	Cases n (%)	Controls n (%)	Total
Parity			
0-2	10 (13.3%)	7 (9.3%)	17 (11.3%)
3	23 (30.7%)	24 (32 %)	47 (31.3%)
4	22 (29.3%)	24 (32%)	46 (30.7%)
5+	20 (26.7 %)	20 (26.7%)	40 (26.7%)
Total	75 (50%)	75 (50%)	150 (100%)
Risk variables of present pregnancy			
Multiple pregnancy	42 (56%)	22 (29.3%)	64 (42.7%)
Genital tract infection	57 (76%)	42 (56%)	99 (66%)
Obstetric history			
History of preterm uterine contraction in previous pregnancies			
29 (38.7%)	7 (9.3%)	36 (24%)	
History of preterm pain in previous pregnancies			
33 (44%)	8 (10.7%)	41 (27.3%)	
Multigravid women with previous 1st trimester abortion			
37 (49.3%)	16 (21.3%)	53 (35.3%)	
Multigravid women with previous 2nd trimester abortion			
26 (34.7%)	13 (17.3%)	39 (26%)	
Multigravida women with previous preterm birth			
40 (53.3%)	5 (6.7%)	45 (30%)	
Prim gravid women with previous 1st trimester abortion			
23 (30.7%)	20 (26.7%)	27 (18%)	
Prim gravid women with previous 2nd trimester abortion			
5 (6.7%)	7 (9.3%)	12 (8%)	

Most of the respondents with history of multiple pregnancies of the current pregnancy are cases 42 (56%) compared to control 22 (29.3%) further more majority of cases with history of genital tract infection for this pregnancy 57 (76%) more than control 42 (56%). However, both groups gave almost the same history of the parity. A total of 45 (30%) of the of the respondents with history of previous preterm births for both cases and controls. The proportion of patients who having preterm birth among cases was higher than the proportion of patients among control; 53.3% versus 6.7% respectively. In addition, the rate of patients who having history of abortion even primary or multiple gravid in any stage of pregnancy where higher among cases than control.

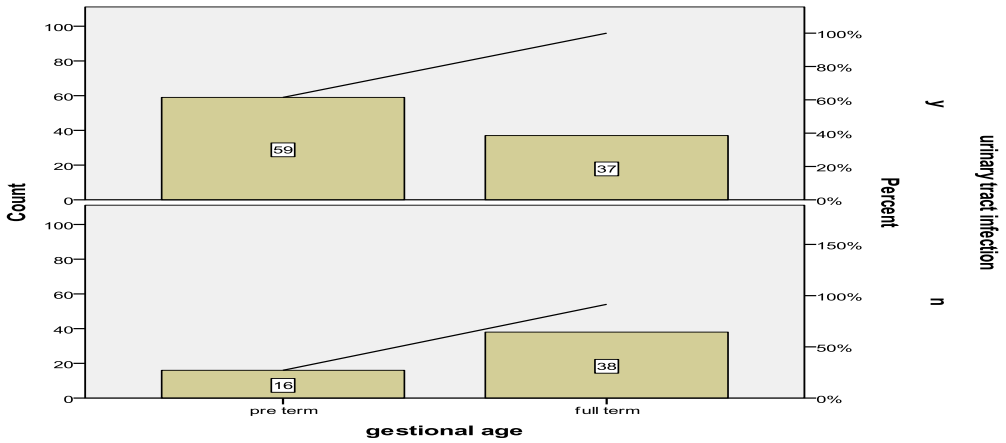
1.4 Past medical history profile

Table 1.4: Descriptive of study population according to past medical history

Variables	Cases n (%)	Controls n (%)	Total
Urinary tract infection	37 (49.3%)	61 (81.3%)	98 (65.3%)
Hypertension	38 (50.7%)	16 (10.7%)	54 (36%)
Surgical History	14 (18.7%)	10 (13.3%)	24 (16%)
Cardiovascular disease	0	1 (1.3%)	1 (1.3%)
Metabolic disorder	-	-	-

For patients who had history of urinary tract infection 98 (65.3%) higher rate among control than cases 81.3% and 49.3% respectively, differed from hypertension were highest proportion among cases than control 50.7% and 10.7% respectively.

Figure 1.3: Urinary tract infection with preterm birth



2. Bivariate analysis

The analyses were carried out by both bivariate and multivariate analysis. For bivariate analysis Chi square and Mann Whitney U test were used. The odds ratio was obtained by using risk from crosstabs. For adjusted odds ratio, logistic regression was performed to control for possible confounders.

2.1. Socio-demographic profiles:

2.1.1 Maternal Age

Table 2.5: Bivariate analysis of socio-demographic factors (maternal age)

Age groups (years)	Cases n (%)	Control n (%)	X^2	OR	95%CI	P value
20-24	10 (13.3%)	34 (45.3%)	23.880	1.43	(0.62-3.30)	NS
25-29	32 (42.7%)	29 (38.7%)		0.56	(0.30-1.04)	NS
≥ 35	33 (44%)	12 (16%)		4.90	(2.38-10.09)	< 0.001*
All ages	75 (50%)	75 (50%)		-	-	-

** Significant at p < 0.05, NS: Not Significant*

The proportion (44%) of age 35 and more years group among cases were significantly higher than proportion of ≥ 35 years old group among control (16%). After performing chi square analysis, the age were significantly associated with the risk of preterm birth; (X^2 = 23.880, p < 0.001, OR = 4.90, 95% CI (2.38-10.09). So; women with age 35 and more years old are 7 times more likely to deliver preterm than those with age < 35 years old.

2.1.2. Socio-economic Background:

Table 2.6: Bivariate analysis of socio-economic background

Variables	Cases n (%)	Control n (%)	X^2	OR	95% CI	p value
1 . Level of education						
Primary school	4 (5.3%)	0 (0%)	90.520	1.00	0.463-.814	0.105
Secondary school	26 (34.7%)	21 (28 %)		0.45	0.30-.68	< 0.001*
University/college	45 (60 %)	54 (72 %)		2.67	1.78-4.00	<0.007
No formal education	0	0		-	-	-
Total	75 (50%)	75 (50%)				
2 . Occupation						
Professional	11 (14.7%)	20 (26.7%)	12.040	.864	0 .346 – 2.162	0.755
Supporting staff	43 (57.3%)	22 (29.3%)		3.071	1.450 – 6.506	0.003*
House wife	21 (28%)	33 (44%)		1.157	.463 – 2.894	0.105
Total	75 (50%)	75 (50%)				
3. Socio-economic status (Income)						
(200-300)	48 (64%)	38 (50.7%)	86.960	2.60	1.36 – 4.15	< 0.001*
(400-500)	27 (36%)	37 (49.3%)		1.000	1.261- 6.496	1.00
Total	75 (50%)	75 (50%)				

**Significant at p < 0.05, NS Not Significant*

1. Level of education

Bivariate analysis was done to show the association between level of education and preterm birth. It was found that woman with secondary school level was risk group to deliver preterm birth which was higher among cases than control (34.7% versus 28%). From chi square test, the relation between secondary levels of education was statistically significant to develop preterm birth ($X^2 = 90.52$, $p < 001$).

2. Occupation

Bivariate analysis conducted by using chi square test which was obviously found a significant association between supporting staff worker women with preterm birth; $X^2 = 12.040$, $p = 0.003$.

3. Income

Chi square test showed significant difference between low income and preterm birth: $X^2 = 86.96$, $p \leq 001$. This is related to nutritional deficiency during pregnancy and other disease related to nutrition. The associations between PTB and reproductive risk factors are presented in Table 4.7 among the risk variables of the current pregnancy and past obstetric history; those showing a significant risk association with PTB were multiple pregnancy and previous preterm birth. The rate of multiple pregnancies was higher among cases than the rate among control 56% versus 29.3% with $X^2 = 13.227$ and $p < 0.001$. The rate of previous preterm birth was higher among cases than among control with almost half times 53.3% to 6.7% respectively. Chi square was performed to show the association between type of previous preterm birth and preterm delivery which was strongly significant association ($X^2 = 24.0$, $p = 0.001$).

2.2. Reproductive history profile

Table 2.7: Bivariate analysis of reproductive risk factors

Variables	Cases n (%)	Controls n (%)	X^2	OR	95% CI	p value
Parity						
0 - 2	10 (13.3%)	7 (9.3%)	2.81	1.00	-	ns
3	23 (30.7%)	24 (32 %)		0.95	0.52-1.68	ns
4	22 (29.3%)	24 (32%)		0.91	0.49-1.68	ns
5+	20 (26.7 %)	20 (26.7%)		1.06	0.65-1.72	ns
Total	75 (50%)	75 (50%)				
Risk variables of present pregnancy						
Multiple pregnancy	42 (56%)	22 (29.3%)	13.227	0.326	0.166 - 0.640	0.001*
genital tract infection	57 (76%)	42 (56%)	0.667	0.364	0.172 - 0.770	0.008
Obstetric history						
History of preterm uterine contraction in previous pregnancies						
	29 (38.7%)	7 (9.3%)	40.560	6.124	2.474-15.157	0.041
History of preterm pain in previous pregnancies						
	33 (44%)	8 (10.7%)	30.80	6.380	2.775-15.603	0.018
Multigravid women with previous 1st trimester abortion						
	37 (49.3%)	16 (21.3%)	90.52	1.00	-	-
Multigravid women with previous 2nd trimester abortion						
	26 (34.7%)	13 (17.3%)	122.44	-	-	-
Multigravid women with previous preterm birth						
	40 (53.3%)	5 (6.7%)	24.00	16.00	5.802-44.122	0.001*
Prim gravid women with previous 1st trimester abortion						
	23 (30.7%)	20 (26.7%)	27.30	1.216	0.599-2.472	0.588
Prim gravid women with previous 2nd trimester abortion						
	5 (6.7%)	7 (9.3%)	105.80	0.694	0.210-2.293	0.549

*Significant at $p < 0.05$, NS: Not Significant

2.3. Past medical history profile:

Table 2.8: Bivariate analysis of past medical history

Variables	Cases n (%)	Controls n (%)	X^2	OR	95% CI	p value
Urinary tract infection	37 (49.3%)	61 (81.3%)	11.76	0 .303	0.144-0.637	0.002*
Hypertension	38 (50.7%)	16 (10.7%)	15.36	0.236	0.113-0.492	0.000*
Surgical History	14 (18.7%)	10 (13.3%)	19.40	3.143	1.520-6.500	0.006
Cardiovascular disease	0	1 (1.3%)	-	-	-	-
Metabolic disorder	-	-	-	-	-	

*Significant at $p < 0.05$, NS: Not Significant

The rate of patients who have urinary tract infection among control was higher than the rate among cases; 81.3% versus 49.3% respectively. Bivariate analysis was done and shown significant association was found for women who have urinary tract infection and preterm birth: $X^2 = 11.76$, $p = 0.002$. In contrast the rate of women who have hypertension among cases was higher than controls: 50.7%, 10.7% respectively. Chi square was

performed to show the association between type of hypertension and preterm delivery which was strongly significant association (X^2 = 15.36, p = 0.000).

Multivariate analysis

Multivariate analysis was performed using logistic regression model to determine the most predictor risk factors for Preterm birth. However, all risk factors included in this model were not significant except for maternal age, multiple gestation, previous preterm, hypertension and urinary tract infection (Table 3.9).

Table 3.9: Multivariate analysis (multiple logistic regression models)

	B	S.E.	Wald	df	sig	OR	95.0%CI. For EXP(B)	
							lower	upper
Maternal age(3)	1.854	0.728	6.492	1	0.011	6.4	1.534	26.599
Multiple gestation	2.136	0.728	8.622	1	0.003	8.5	2.035	35.249
Previous preterm birth	0.123	0.031	15.774 5.701	1	0.000	1.1	1.065	1.203
Hypertension	0.089	0.037	12.789 20.059	1	0.017	1.1	1.016	1.176
Urinary tract infection	0.728	0.023		1	0.002	4.6	1.63	4.98
Constant	-4.83	1.08		1	0	0.008	-	-

Multiple logistic regression model relate to preterm birth with factors can be predicted by maternal age, multiple gestation, previous preterm birth, hypertension and urinary tract infection as shown in equation below:

Preterm birth = constant (a) + regression estimate (b) * maternal age + regression estimate (b) * multiple gestation + regression estimate (b) * previous preterm + regression estimate (b) * hypertension + regression estimate (b) * urinary tract infection.

By compensation the values in the equation, we will get the following:

Preterm birth = - 4.83 + 1.85 * maternal age + 2.13 * multiple gestation + 0.12 * previous preterm + 0.09 * hypertension + 0.7 * urinary tract infection.

If we want to see the probability for any subject to have preterm birth, we can calculate it from the following equation: Probability (preterm birth) = 1/ 1+ e-z where (e) denotes the exponential function and (z) = - 4.83 + 1.85 * maternal age + 2.13 * multiple pregnancy + 0.12 * previous preterm birth + 0.09 * hypertension + 0.7 * urinary tract infection.

In this study, it was found that preterm birth is more likely to occur with increasing maternal age ≥ 35 years than other groups (OR = 6.3 CI 95% 1.5 - 26.6, p = 0.011). In this model, logistic regression was showing increasing risk of preterm with multiple pregnancy (OR = 8.5 CI 95% 2.03 - 35.24, p = 0.003). Previous preterm was represented an important predictor with developing preterm birth (OR = 1.13 CI 95% 1.06 - 1.20, p < 0.0001). Moreover, hypertension was also found predictor for preterm birth (OR = 1.09 CI 95% 1.01 - 1.17, p = 0.017). Finally, it almost same with urinary tract infection.

Discussion

This study was a case control study among Libyan women with preterm births (cases) and full term births (control) in Zawia teaching hospital in Zawia city. The main objectives of this study were to identify any significant of maternal medical conditions and other risk factors associated with preterm births. Recall bias is certainly one of the major limitations of a case-control study. This, however, is thought to be relatively moderate since the factors being assessed were related to pregnancy, which many women recall vividly. This assumption is reinforced by the fact that information was extract from ward booking as secondary data and for missed information I was calling mother to complete. PTB is one of the most common obstetric problems, and pre-term neonates are more likely to die than full-term infants. Furthermore, those who survive run a greater risk of disability (1, 16).

In the crude analysis a significant risk association was found between PTB and women who conceived at older but not at younger ages. Older age, however, became significant in the regression analysis when controlling for other variables with (OR 4.90, 95% CI). Contradicting results have been observed in other studies between the age of the mother at conception and PTB (12, 40). Poor socio-economic background and level of education were also both found to be signify-cantly associated with PTB. Similarly, significant associations were observed between PTB and income. All these conditions are interrelated and are proxies for low socio-economic status. This might explain why some of these factors became insignificant predictors of PTB in the forward logistic regression analysis. Similar results have been reported with study done by Lumley (41) that showed different between low income less than $10,000 versus high income $25,000 and more (OR = 4.3 CI 95% 2.1 - 8.7).

A case-control study in Serbia by Cousens (45) showed that factor of level education was significantly related to preterm births were: low educational level (OR = 4.7, 95% CI 2.2 - 10.0) more than highly educated. Compared to this study, opposite findi-ngs were obtained after doing adjusted odds ratio by logistic regression women with higher level of education had more risk than other (OR = 2.67, CI 95% 1.78 - 4.00, p = 0.001). The difference in this study was much more which due to high number of patients who were higher educated this is explained by those women having heavy work for long hours. The study also revealed significant risk assoc-iations between the presence of multiple pregnancies and previous PTB, genital tract infection. This, too, is in accordance with other studies (17, 42, and 43). Previous preterm deliveries significantly increase the incidence of pre-term birth in this study (OR 16.0, CI 5.80 - 44.1, $p < 0.01$), these results were similar to the study was done in Nigeria with similar finding ($p < 0.001$) which indicated to cervical incompetence and cervical dilatation. Pre-term delivery is a well-known complication of multiple pregnancy. In a survey of twin pregnancies in Scotland, Patel et al. as quoted by Whitfield (46) found delivery occur-ring before 37 weeks of gestation in 44% compared with 5.5% of singletons. It is, therefore, not surprising that multiple pregnancy very highly significantly increases the inc-idence of preterm delivery in this study with $p < 0.001$.

Urinary tract infections were found to be a significant risk factor for PTB in this study, which reflects findings in

some other studies (44). The study also investigated the possible association of PTB with histories of other medical diseases. Only one case of Cardiovascular disease was observed among controls and no patient among cases.

Hypertension (OR = 2.16) is relatively common in Zawia and patients usually correctly recall its history and treatment. Other studies have revealed controversial results for an association between smoking and PTB (28). In this study, too few smokers were observed to draw a valid conclusion depended on history of passive smoking. Due to social stigma women in Libya have been reluctant to state their smoking habits, so it is possible that the presence of smokers in this study has been underreported. One of the most strong limitation of this study was BMI, where it is not reported in files and most patients had not exact figures on their weight and height also due to poor antenatal visit from some of patients, on other hand, anemia in Libya considered common but I can not did it because time of the study and there is no information about the prevalence of anemia among pregnant women in Zawia city. Many of the suspected risk factors listed above are interrelated with each other and probably with some other cofactors. Nevertheless, the majority of significant associations observed in the study remained so after conducting a forward logistic regression analysis. In Conclusion Addressing preterm birth is essential for reducing the pronounced inequities in neonatal health and for the greatest focus on preterm birth will also benefit maternal health. Our study highlights the important risk factors that associated with preterm births among women in Libya. Hypertension and Urinary tract infection was the most important risk factor in this study. Bivariate analysis showed significantly association between these factors and preterm births but failed to be predictor in multivariate. On the other hand, previous preterm birth for long time was the most important predictor for preterm births in this study. There was association between multiple pregnancies and preterm births. Moreover, multiple pregnancies were predictor preterm birth in multivariate analysis. This study also showed a strong link between advancing age and preterm birth. Finally, heavy worker was a risk factor for preterm birth in this study. However most of above risk factors, which have been found to be associated with preterm, are modifiable. They should be taken into consideration in the planning of a preventive program to decrease PTB and its sequel for mortality and morbidity among infants in Libya.

Recommendations: Preterm birth is a major challenge for maternal and perinatal care worldwide and a leading cause of neonatal morbidity and mortality. Children born prematurely have higher rates of learning disabilities, cerebral palsy, sensory deficits and respiratory illnesses compared to children born at term. These negative health and developental effects of preterm birth often extend to later life, resulting in enormous medical, educational, psychoogical and social costs. Hence, to reduce the perinatal morbidity and mortality in our community: there is need to improve upon our antenatal care services to enable us identify the women at risk and give them health education, adequate rest and possible treatment of identifiable cause of preterm birth. High risk patient identified in peripheral centers should be referred to tertiary health care centre. All doctors and nurses should be advised to measure height and weight of patient and well trained on

treatment and management of abortion complication, also there is need to educate our women on the use of family planning and family planning commodities should be available affordable and accessible. There is a paucity of data on preterm birth prevalence and mortality and almost complete absence of data on acute morbidity and long term impairment associated with prematurity in Libya and neighborhood countries. There are many reasons for poor state of preterm birth related epidemiology in Libya that include poor health related statistics and information systems, lack of preterm birth surveillance registries or poor coordination among existing registries and reliance on hospital based rather than population based studies. Our understanding of the exact causal pathways resulting in preterm labor still remains obscure and more research is needed to find the interventions that are effective at preventing preterm births. However, there is a lot that can be done now. For example, in high income countries there needs to be more focus on preconception health. Women planning a pregnancy should be encouraged to adopt a healthy lifestyle. In our country, there are several simple low cost interventions that can help promote a healthy pregnancy outcome, such as treating malnutrition in women before and during pregnancy, treating high blood pressure and diabetes, and monitoring pregnancies for problems. Care for preterm babies can also be low cost and effective, such as keeping the baby warm, treating infections, and providing adequate nutrition. Governments need to pay more attention to preterm birth as a serious health issue.

Funding research to find the causes and to identify the causes of preterm birth, encouraging investment of public and private research institutions to identify and test promising intervention, helping health care providers to improve risk detection and address risk factors, education of women about risk reduction strategies and the signs and symptoms of preterm labor, providing information and emotional support to families affected by prematurity are the few key strategies that can be adopted at the regional and national level. This study need to further research in the future and should be in a broader and more detailed information regarding risk factors related to preterm birth in Libya.

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