Risk Factors for Preterm Labour in Diyala Governorate Case - Control Study

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Abstract

Background: Preterm birth is amajor deter minant of neonatal mortality,morbidity and childhood dis ability and re mains as one of the most serious problems in obstetrics. Prema turity is now consideredas the second-leading cause of death in children aged less than 5 years and as the most important cause of death in the cri tical first month of life.

Objective: To identify risk factors that were related to preterm birth and compare that with control sample.

Patients and Methods: A case control was carriedout during the period from 1st August 2017 to 15th November 2017. Which including 100 cases and 100 controls. Who where selected from Diyala city/Teaching AL-Batool hospital. Data collected by directinterview with patient using especially desi gned questionnaire.

Results: The result showed that the majority of cases were (29%) among age group (20-29) years. Some factor are showed significant such as age occupational state and number of abortion and other not significant like smoking.

Conclusion: This study shows The factors that found significant association with pre term birth consist of age, number of abortion, history of stillbirth, previous history of pretermbirth, previous history of CS, placental problem during pregnancy, accidental hemorrhage, hypertension, Diabetes mellitus, urinary tract infection and antenatalvisit. And factors which not have significant associated with PTB is parity, vaginalinfection and smoking.

Keywords: Preterm, Delivery ,Risk Factors, Diayla.

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Introduction

Preterm birth (PTB) also known as prematurebirth, is the birth of ababy at fewer than 37 weeks gestational age [1]. It is further classified into threemain categories: mild, verypre-term and extremely preterm for births occurring at 32–36 weeks,28–31 weeks and lessthan28 weeks res pectively [2].Preterm birth continues tobe the leading cause of perinatal and postnatal mortality and morbidity especially in developing

countries,where health facilities are limited but are not functioning properly. In spite ofour knowledge about theproblem, globally, preterm births are possibly one of the commonest causes of maternal and child health problems in developed societies [3] . Babies born prematureely have increase ed risks of neurological developmental disorders such as severe cerebral palsy, mentalretardation,sensory,disturbances(impai red vision, hearing impairment) and hydrocephalus, or pr0blems like learningdifficulties, language, impaired concentration or attention, hyperactivity, motor disabilities, and cognitive problems. Aboutone fifth of babies born under 32weeks of age cannot survive the firstyear compared with 1% of deaths of infants born at the age of 33 - 36 weeks and onlyabout 0.3% of infant deaths when the birth was at sufficient months [4],[5]. The cause of pretermbirth is complex and multifactorial. Several factors are expected to increase the risk Of the incidence of prematurebirth, including maternal age,education, parity, pregnancyinterval, preterm birth history, history of abortion, prematurerupture of membranes (PROM), antepartumhemorrhage, anten atal care, and maternaldiseases, for example hypertension, UTI and evensome of preterm births that occurred spontaneously did not show apparent risk factors [6] . Knowledge of risk factors is crucial for predicting the incid ence of preterm birth in order to reduce theincidence of premature childbirth[5].

Complications from pretermbirths resulted in 0.81 million deaths in 2015 down from 1.57 million in 1990 [7]. The chance ofsurvival at fewerthan 23weeks is closeto zero, while at 23weeks it is 15%, 24weeks 55% and 25weeks about 80% [8] . The chances of survival without long term difficulties are lower [9].

Comparing with children born at term, preterm infants face to higher risk ofseveral disabilitiesincluding neuro-developmental impairments, gastrointestinal complications, cerebral palsy, sensory deficits, learning dis abilities, and respiratory illness [10] . The morbidity associated with pretermbirth often extends to later life resulting in physical, psychological, and economic costs [11] . The precise role of eventslinked to an increased risk of preterm birth is unknown [12].

However,there have been anumber of previous studies attempting to identify risk factors associated with pretermbirth in different countries

Patients and Methods

Samples: A case/control studywas conducted in Diyala city/Teaching AL-Batool hospital..was chosen for thisstudy and The sample was selected by (non probability convenient sampling) and samplesize was 200 included 100 cases with pretermbirth and 100 controls with fullterm matched by age. The studystarted from 1st August 2017 to 15th November 2017.The data was collected by directinterview using special questionnaire to obtained socio-demographic information (age , occupation , education) ,and obstetrical history (twin,

birthspace interval, abortion and parity) , chronic disease, and smoking .

Cases were defin ed as pregnant wɵmen witha pretermbirth (29≤37weeks) by vaginaldelivery ɵr caesarean sectiɵn [1].

Contrɵls weredefined as pregnant wɵmen admitted tɵ the same hɵspital with fullterm livebirth (>37weeks)by vaginaldelivery or cesareansection.

Cigarette smoking: Based on maternal self-reporting, mother's smoking status was categorized into 1 of 3 groups: "nonsmoker (did not smoke throughout the pregnancy) , smoker (smoked duringpregnancy) , and passive smoker (had a household member who smoked more than 10 cigarettes perday inside or outside of the house") [13].

Statistical analysis

Data wasanalyzed by SPSS packageversion 18,X2 test was used for significance of P-value of <0.05 was considered significant. odds ratio with 95% confidenceinterval was used to appreciate the impact of different variables on the risk of presenting preterm birth.

Results

Table (1) shows that higher per centage (29.0%) of cases samplewas in the agegroup (20-29)years, andthe higherpercentage (32.0%) of control was in the age grɵup (20-29) years. This difference was statistically signify cant (P-value) =(0.04) and shows thehigher percentage of cases in education level at secondary school is (18.0%) , and the higher percentage of control in primary school is (24.5%), and the higherpercentage of occupation of the sample in this study were housewife (34.0%) in cases and (46.5%) in control. Thisdifference was statistically signifi cant ("P-value") = (0.000).

Table (1): Distribution of Demographic characteristics sample according to cases andcontrol

Age	Groups				Total		P-value
	Cases		Controls				
	No	%	No	%	No	%	
< 20	11	5.5	7	3.5	18	9.0	0.04 S
20 – 29	58	29.0	64	32.0	122	61.0	
30 – 39	26	13.0	26	13.0	52	26.0	
40 and more	5	2.5	3	1.5	8	4.0	
Total	100	50.0	100	50.0	200	100.0	
Mean Std. Deviation	25.2 ± 0.671						
Education level							
Illiterate	11	5.5	11	5.5	22	11.0	P-value= 0.02 S
Primary school	34	17.0	49	24.5	83	41.5	
Secondary school	36	18.0	23	11.5	59	29.5	
College and above	19	9.5	17	8.5	36	18.0	
Total	100	50.0	100	50.0	200	100.0	
Occupation status							
Worker	32	16.0	7	3.5	39	19.5	P-value =0.000 HS
House wife	68	34.0	93	46.5	161	80.0	
Total	100	50.0	100	50.0	200	100.0	

*No = number % = percent, <=less than, P= probability level, S= signify cant at "P<0.05".

Table (2) shows the higher percentage of birth space lessthan 2years (38.0%) in cases and (25.5%) in control. This difference was statistically significant (P-value)=(0.000).

Table (2): Distribution of birth space interval according cases and control

Birth space interval	Cas es		Cɵntrols		Total		O R	"95 % CI"	P- value
	Nɵ	%	Nɵ	%	Nɵ	%			
< 24 months	76	38.0	51	25.5	127	63.5	3.04	1.66-5.56	0.000 HS
≥24 months	24	12.0	49	24.5	73	36.5	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No= number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , H.S= highlysignificant at "P<0.05"

Figure (1) shows the relation between hsCRP level and the severity of coronary artery disease among patients documented to have CAD and it showed that there was a significant differences between single, double and three vessels of coronary artery disease (P value = 0.000).

Table (3):) Distributiɵn ɵf parity accɵrding cases andcontrol

Parity	Ca ses		Contrɵls		Total		O R	95 % CI	P - value
	No.	%	Nɵ.	%	No.	%			
1– 3	51	25.5	62	31.0	113	56.5	0.606	0.32-1.11	0.026 S
4 and mɵre	11	5.5	10	5.0	21	10.5	0.81	0.3-2.17	
No	38	19.0	28	14.0	66	33.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , N.S= non significant at P>0.05.

This tableshows the higherpercentage (25.5%) is non-abortion in cases , and higher percentage (34.5%) in control in non-abortion also. This difference was statisticallysignificant"(P-value)"= 0.04.

Table (4): Distribution of abortion according cases and control

No. of abortion	Ca ses		Contrɵls		Total		O R	95 % CI	P- value
	No.	%	No.	%	No.	%			
1– 2	42	21.0	29	14.5	71	35.5	1.95	1.07-3.55	0.04 S
3 – 4	4	2.0	1	0.5	5	2.5	5.41	0.58-49-87	
≥ 5	3	1.5	1	0.5	4	2.0	4.05	0.41-40.15	
Nɵ	51	25.5	69	34.5	120	60.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, ≥ more than and equal , OR= odds ratio, CI= confidence interval, P= probability level, S= significant at P<0.05.

This table shows the higherpercentage in women not have history of stillbirth in cases (36.0%) , and the higher percentage in women not have history of stillbirth in control (36.0%) . This differencewas statisticallysignificant "(P-value)" = 0.009.

Table (5): Distributiɵn ɵf the sample accɵrding to still birth history

History of still birth	Ca ses		Contrɵls		Total		O R	95 % CI	P- value
	No.	%	No.	%	No.	%			
Yes	28	14.0	13	6.5	41	20.5	2.6	1.25-5.39	0.009 HS
Nɵ	72	36.0	87	43.5	159	79.5	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , H.S= highly significant at P<0.05.

Table(6) shows higherpercentage of women not have multiplepregnancy (41.0%) in cases , and higher percentage of women do not have multiple pregnancy (48.0%) in control. This difference was statisticallysignificant " (P-value)" =0.002.

Table(6): Distributiɵn of multiplepregnancy accɵrding cases andcontrol

Multiple pregnancy	Ca ses		Contrɵls		Total		O R	95 % CI	P-va lue
	No.	%	No.	%	No.	%			
Yes	18	9.0	4	2.0	22	11.0	5.26	1.71-16.19	0.002 HS
No	82	41.0	96	48.0	178	89.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , H.S= highly significant at P<0.05.

Table (7) show higher percentage in women who do not have previous history of pretermdelivery (29.5%) in cases , while higher percentage in women don't have previous history of pretermdelivery (43.5%) in control . This difference wasstatistically signify cant "(P-value) " = 0.000.

Table(7): Distributiɵn of previoushistory of pretermdelivery

Previous history of preterm delivery	Ca ses		Contrɵls		Total		O R	95 % CI	P-value
	No.	%	No.	%	No.	%			
Yes	41	20.5	13	6.5	54	27.0	4.65	2.29-9.42	0.000 HS
No	59	29.5	87	43.5	146	73.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , H.S= highlysignificant at "P<0.05"

Table(8)shows the higherpercentage in women who don't have Previous delivery by CS (27,0%) in cases , and higherpercentage in women who don't have Previousdelivery by CS(38.5%) in control . Thisdifference wasstatistically signify cant < "(0.001)".

Table(8): Distribution of previous delivery by CS according cases and control

Previous delivery by CS	Ca ses		Contrɵls		Total		O R	95 % CI	P-val ue
	No.	%	No.	%	No.	%			
Yes	46	23.0	23	11.5	69	34.5	2.85	1.55-5.24	0.001 HS
No	54	27.0	77	38.5	131	65.5	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , H.S= highlysignificant at "P<0.05".

Table(9): shows the higherpercentage in women who don't have Placental problem during this pregnancy (38.5%) in cases , and the higher percentage in women who don't have Placental problem during this pregnancy (45.5%) in control Thisdifference wasstatistically signifi cant "(P-value)" = 0 .007.

Table(9): Distribution according Placental problem during this pregnancy according cases and control

Placental problem during this pregnancy	Ca ses		Controls		Total		O R	95 % CI	P-v alue
	No.	%	No.	%	No.	%			
Yes	23	11.5	9	4.5	32	16.0	3.02	1.31-6.91	0.007 HS
No	77	38.5	91	45.5	168	84.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , H.S= highlysignificant at P < 0. 05

Table(10) shows thehigher percentage in women who don't have acid ental hemorrhage (17.5%) in cases , and the higherpercentage in women who don't have accidental hemorrhage (44.5%) in control . This differ ence wasstatistically signifi cant "(P-value)" = 0 .01.

Table(10): Distribution of Accidental hemorrhage according cases and control

Accidental hemorrhage	Ca ses		Controls		Total		O R	95 % CI	P-v alue
	No.	%	No.	%	No.	%			
Yes	25	12.5	11	5.5	36	18.0	2.69	1.24-5.84	0.01 S
No	75	17.5	89	44.5	164	82.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, "OR"= odds ratio, "CI"= confidence interval, "P"= probability level, significant at P<0.05.

This table shows the higherpercentage in women who don't "HB" is (37.0%) in cases , and shows the higherpercentage in women who don't "HB" is(43.5%) in control , and the higher percentage in women who don't "DM" is(43.0%) in cases , the higherpercentage in women who don't "DM" is (48.0%) in control , and higherpercentage in women who have "UTI" is (37.5%) in cases , and higherpercentage in women who haven't "UTI" (34.0%) in control, the higher percentage in women who don't have vaginal infection is (49.0%) in cases and (48.0%) in control.

Table(11): Distribution of found disease during pregnancy according cases and control

Found disease during pregnancy	Ca ses		Controls		Total		O R	95 % CI	P-va lue
	No.	%	No.	%	No.	%			
Hypertension									
Yes	26	13.0	13	6.5	39	19.5	2.35	1.12-4.901	0.02 S
No	74	37.0	87	43.5	161	80.5	-	-	
Diabetesmellitus									
Yes	14	7.0	4	2.0	18	9.0	3.9	1.23-12.32	0.01 S
No	86	43.0	96	48.0	182	91.0	-		
UTI									
Yes	75	37.5	32	16.0	107	53.5	6.37	3.43-11.82	0.000 HS
No	25	12.5	68	34.0	93	46.5			
Vaginal infection									
Yes	2	1.0	4	2.0	6	3.0	0.49	0.08-2.73	0.4 NS
No	98	49.0	96	48.0	194	97.0			
Total	100	50.0	100	50.0	200	100.0			

Table shows (12) the higherpercentage in women who visit antenatal ANCmore than 4visit (39.0%) in cases , and the higher percentage in women whovisit antenatal ANCmore than 4 visit (30.5%) in control . Thisdifference was statisti cally signify cant "(P-value)" = 0.02.

Table(12): Distribution of No. of antenatal center visit ANC according cases and control

No. of antenatal center visit ANC	Ca ses		Controls		Total		O R	95 % CI	P-va lue
	No.	%	No.	%	No.	%			
Less than 1 visit	4	2.0	5	2.5	9	4.5	-	-	0.02 S
2 – 3	18	9.0	34	17,0	52	26.0	0.66	0.15-2.77	
≥ 4	78	39.0	61	30.5	139	69.5	1.59	0.41-6.207	
Total	100	50.0	100	50.0	200	100.0	-	-	

***No = number % = percent, ≥ more than and equal OR= odds ratio, CI= confidence interval, P= probability level, S= significant at P<0.05.**

Table (13) show the higherpercentage in pregnancy women who are non-smoker (31.0%) in cases and the higher percentage in pregnancy women whoare non-smoker (31.0%) in control.This difference wasstatistically signify cant "(P-value) "= 0.9.

Table(13): Distribution of smoking according cases and control

Smoking	Ca ses		Controls		Total		O R	95 % CI	P-va lue
	No.	%	No.	%	No.	%			
Smokers	3	1.5	4	2.0	7	3.5	0.75	0.16-3.49	0.9 NS
Passive smokers	35	17.5	34	17.0	69	34.5	1.02	0.57-1.85	
Non-smokers	62	31.0	62	31.0	124	62.0	-	-	
Total	100	50.0	100	50.0	200	100.0	-	-	

*No = number % = percent, OR= odds ratio, CI= confidence interval, P= probability level, , N.S= non significant at P>0.05.

Discussion

World HealthOrganization (WHO) defin ed prematurebirth or pretermbirth as the birthoccurring after20weeks and before 37weeks of gesta tion [14]. Prematurebirth is a syndromeassociated with neonatal morbidity, which hasadverse consequences for long-term health [15].

In this study, most of the women in both study groups belongs to the age (20-29) years age group, thus the maternalage of (20-29) years hasbeen found tobe the signifi can't age group for pretermbirth with P-value < 0.04%. The finding of the pre sent study is in agreement with the study done by Samim A Al-Dabbagh etal .2006 in Iraq [16] andby Adnan Lutfi Sarhan.2015 in Palestine [17], they have iden tified with the rate of premature deliveries was signifi cantly greater for women age between (20-29) years. The result of the study show that women who completed primary education and thus who where education hadsimilar chances for premature delivery . A study done in Mosul city in Iraq [16] found that women who where illiterate had similar chance for prematuredeliveries.

In this study the housewives are more risky group for occurrence preterm delivery, this result confirms with the study done by Samim A Al-Dabbagh etal .2006 in Iraq [16], and by Shakhawan A. Ahmed.2016 in Rania [18], and by FANAKA A, etal .2016 in Tanzania [19], they have identified – signifi cant association between heavywork and pretermbirth. This could be ex plained the limitingthe amount of work done by pre gnant women and avoiding fati gue helpsreduce the risk of "PTB" [20,21]. Regard ing birthspace interval (less than 2years) was higher among women with preterm delivery (33%) compared to control group (25.5%) with signifi cant association P-value <0.00% ,this result is in accordance with the study done by Hayelom Gebrekirstos, etal.2016 in Ethiopia [22], pre gnancy intervalmakes adifference aswomen with 6 months span or lessbetween pre gnancies have two-fold in crease in pretermbirth [23]. High parity have no significant association with pretermbirth with P-value > 0.05. These results aresimilar with finding of the study by Samim A Al-

Dabbagh etal .2006 in Iraq [16] andby Adnan Lutfi Sarhan.2015 in Palestine [17] ,and by FANAKA A, etal .2016 in Tanzania [19], reported that the parity was not found to be signifi cant risk factor of pretermbirth .But this result dis agree with the study by Aragao VM, etal.2004 in Brazil [24] ,found that prim parity is a risk factors of pretermbirth, this could be explained the difference be tween thesestudy and ɵther stud ies mayrefer to the strɵng familyplanning prɵgrams in these countries, whichmade the studysample to be at the samelevel in relatiɵn to par ity. In this study ,there is significant association between previous abortion , stillbirth with preterm delivery with P-value 0.00 the finding of the present study is agree ment with finding , reported by Samim A Al-Dabbagh etal .2006 in Iraq [16]. Signifi cant association was found between the multiple pregnancy and pretermbirth were at greater risk of having preterm birth (OR:5.26;95%CI:1.71-16.19) when compared with reference group. Similar finding werereported in study done by Adnan Lutfi Sarhan.2015 in Palestine [17], ,and by FANAKA A, etal .2016 in Tanzania [19],report that pretermbirth and multiplepregnancies were fɵund to have a positiveeffect ɵn pretermbirth (twins, tri plets, and qua druplets) (P=0.001),Twin pre gnancies carry a high risk ɵf spon taneous pretermbirth cɵmpared with singletɵn pre gnancies this may be because multiple pregnanciescause ɵver diste onsion ɵf the ute rus and de creased levels ɵf progesterone , whichmay leadto preterm labɵur , malepresentation which indi cates Caesar ean section[17].

Previous history ɵf pretermbirth was found to be a significantrisk factor were at greater risk of having preterm birth (OR:4.65;95%CI 2.29-9.42) when compared with reference group. Similar findingwere reported in study done by FANAKA A, etal .2016 in Tanzania [19] wɵmen whɵ hada spɵntaneous pretermbirth (SPTB) weremore like ly tɵ have a spɵntaneous pretermbirth "(IPTB)" weresignificantly mɵre likely tɵ have had a pervieus indicatedpretermbirth , so "SPTB" are strɵngly re petitive [25].

This study demonstrated that the delivery by CS more (OR:2.85) time, more to occurrence pretermbirth than other group,95% CI=1.55-5.25 which carried a very highly signifi cant association P-value <0.00, the result agree ment with the study done by Adnan Lutfi Sarhan.2015 in Palestine [17]. Placental problem during this pre gnancy was found to be a significant riskfactor were at greater risk of having pretermbirth (OR:3.02;1.31-6.91) when compared with reference group. Similar finding were reported in study done by Samim A Al-Dabbagh etal .2006 in Iraq [16]. Accidental hemorrhage has also been suspected as arisk factors [26] in the presentstudy, an OR of 2.69 The same result, was seen in study done by Samim A Al-Dabbagh etal .2006 in Iraq [16], and by Nguyen N, Savitz DA.2004 in Vitnam [26]. Reported that an ORof 2 .31 fɵr hemɵrrhage wasfound butwas not signif cant this mightbe dueto the smallnumber ɵf casesdetected.

Urinarytract infections ,diabetes mellitus , and pregnancy hyper tension ,werefound tobe a signify cant risk factor "PTB" in thisstudy , no asso ciation , however wasobserved bet ween "PTB" and vaginal infection .These result aresimilar with finding of he study done by Samim A Al-Dabbagh etal .2006 in Iraq [16],and by Adnan Lutfi Sarhan.2015 in Palestine [17].Theincidence of these infections as deter mined by clinicalcase histories only and nodirect laboratoryresults more avail able to the authors. Itis po ssible that women may confuse the twoinfection or maybe more pown toreport urinaryrather that genitalia infection . In this study , there is signification association between antenatal visit with pretermdelivery , with P-value 0.02. The finding of the present study is agree ment with findings reported by Samim A Al-Dabbagh etal .2006 in Iraq [16], and by Kemenkes, R.I.2014 in Indonesia [27] found cases had under-gone a greater number of antenatalvisit thanhad the control, mainly for pregnancy complication. This could be ex plained by the coverage of ante natal care isvery low inIraq, about 30 %, antenatalvisits are main ly made for highrisk pregnan cies [28].

Theresult of the current studyrepresented that there was no significant association between maternal smoking with PTB. These result are similar with finding of the study by Samim A Al-Dabbagh etal .2006 in Iraq [16],and by Adnan Lutfi Sarhan.2015 in Palestine [17].

Reported that maternalsmoking in gen eral was not found to be signify cant CP= 0.113. This may be because social stigma women in Iraq havebeen re luctant to statetheir smoking habit [29].

Conclusions

This study shows higher rate of pre termbirth occurs in agegroup 20-29 years . Factors that were associated with pre term birth were low educational level, There is high significant associated with housewife, short spacing lessthan 24 months , and multiparity , abortion history of stillbirth , multiple pregnancy and history of preterm delivery, previous delivery by CSand lowANC visits . Obstetric problems of the current pregnancy seem to be crucial for the occurrence of pre term birth these in clude have placental problem and hemorrhage, hypertension, DM and UTI.

Maternal behaviors that appear to contribute to having a pre termbirth were passive smoking.

Recommendations

Improving programs of health education and communication regarding pregnant women with prenatal and postnatal periods as early as possible. Using different type of massmedia to stimulate public awareness about the risk factors of pretermlabor.

Emphasizing a collaborated work among Ministry of Health, Ministry of higher Education, and Ministry of Environment to include within their curriculums a course regarding risk factor that leads topreterm labor.

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