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Determining The Rate Of Normal Delivery, Miscarriage And Delivery Before Normal Time In Population of District Karak, Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Present study was conducted in district Karak to determine the rate of normal vaginal delivery, caesarian section delivery, miscarriage and delivery before time in district Karak. The study also aimed to determine the age dependent variations in these parameters in the population. Data was collected from district headquarter hospital, Karak and various clinics from 2015 to 2020. Data was distributed age wise also, linear regression was applied to determine year wise trend in the number of cases from 2015-2020. Percentage of normal delivery in 2015 was 63% which was reduced to 61 percent in 2020. Rate of caesarian section delivery in 2015 was 28% which increased to 30 % in 2020. However, percentage of miscarriage decreased from 6% to 5.5% from 2015 to 2020. Delivery before normal time was also increase from 2.8% to 3.26 percent in head quarter hospital, Karak. Percentage of normal delivery in 2015 was 70% which was reduced to 40 percent in 2020. Rate of caesarian section delivery in 2015 was 23% which increased to 40% in 2020. Similarly, percentage of miscarriage increased from 6% to 12% from 2015 to 2020. Delivery before normal time was also increase from 2.5% to 7.5 percent in clinics.Linear regression showed no significant difference in p value in different age groups except in the age group of 15 to 20 years age. Similarly, R2 value for delivery before time in20-30 years of age was also significantly high. No other groups showed significant R2 trend from 2015-2020. These results suggest that the risk factors related to this increase should be determined in pregnant women for normal healthy delivery. This early data provides basis for more studies to be done in district Karak in order to determine the factors associated with the rise in pregnancy loss and ceasarian section deliveries in district Karak.

Keywords: Determining, Normal delivery, miscarriage, delivery before time, Karak

INTRODUCTION

Pakistan was among the last nations in Asia to experience a substantial and sustained decline in fertility. Recently, however, the total fertility rate has decreased by about 2.5 births per woman in a period of less than two decades, a relatively rapid and unambiguous decline. This large decline is the result of an (Feeney and Alam, 2003) increased desire on the part of Pakistani couples to space and limit their number of births and of an increase in the practice of contraception. Estimates for the period from the 1960s through the 1980s indicate that Pakistani women had, on average, six or more births during their reproductive careers. Since the 1980s, fertility has declined to an estimated 5.4 children per woman in the early to mid-1990s, to 4.8birthsin 2000–01, and most recently to 3.9 births in 2003 (FBS), 2005).

What distinguishes Pakistan is the inconsistency between the magnitude of the recent decline in average family size and the relatively low level of

contraceptive use. The proportion of married women using a modern contraceptive method increased from 9 percent in 1990–91 to 20 percent in 2000–01. A further discrepancy, between contraceptive use and fertility desires women's desire to post pone the next birth or to stop having children is seen in the high level of unmet need for family planning. The proportion of currently married women who are fecund and not practicing contraception but who do not want to be pregnant stood at 33 percent in2000–01, according to the Pakistan Reproductive Health and Family Planning Survey 2000–2001 (NIPS 2001). Consistent with these findings is the trend in unplanned childbearing (the combination of unwanted births and mistimed births): the proportion of recent births that are unplanned rose from 21 percent in 1990–91 to 28 percent in 1996–97 and to 35 percent in2000–01. These indicators unmet need for contraception and the proportion of births that are unplanned confirm that a large proportion of currently married women in Pakistan are at risk of experiencing an unwanted pregnancy and, potentially, of undergoing an abortion. A high rate of induced abortion is also a plausible explanation for the apparent inconsistency between the persistent low levels of contraceptive use and the rapid decline in family size. A rise in both contraceptive use and abortion rates has been observed in other countries, including Korea, that are experiencing fertility decline (Marston and Cleland, 2003).

Convenient and immediate provision of health care facilities for pregnant women in all countries across the globe is highly important (Norheim *et al.*, 2015). The instant availability of obstetric care for pregnant women also includes the provision of medical facilities for caesarean section deliveries (Bhutta *et al.*, 2012). Although caesarean sections are considered to be a safe surgical procedure (Liu *et al.*, 2004), the progressive increase in caesarean births during the past few years has attracted the attention of public health experts globally (Amjad*et al.*, 2018). In 2018, more than half of all deliveries were caesarean sections in Brazil, Egypt and Turkey. Data from the United States of America, Australia and Germany reveal that almost one in every three pregnant women has a caesarean section delivery (Niino, 2011). Similarly, a rising trend of caesarean section deliveries has been documented in South Asian countries including Pakistan, where it increased from 3.2% (1990) to 20% (2018) (Niino, 2011; Boatin*et al.*, 2018). From 1985 to 2015, the international healthcare community considered the ideal rate for caesarean sections to be between 10 and 15%. However, since the large increase in caesarean section rates, the World Health Organization no longer recommends a specific rate for countries to achieve related to their population level (Organization, 2018). The findings of some ecological studies reveal that caesarean deliveries do not tend to reduce the mortality rate when it is above 10%. Rather, the chances of mother and foetus mortality increases when the caesarean rate exceeds 15%. Previous research highlights that the mortality rate becomes 2 to4 times higher among the women who delivered through caesarean section compared to those who had a vaginal delivery (Althabe*et al.*, 2006; Solheim*et al.*,2011; Molina *et al.*, 2015).

Preterm birth, defined as birth occurring prior to 37 completed weeks, is a worldwide health issue with a marked difference in prevalence between developed and developing countries (Steer, 2005; Goldenberg *et al.*, 2008; Beck *et al.*, 2010). The global prevalence of preterm birth is 9.6%. The rate of preterm birth in Pakistan is 15·7% whereas it is 6·6% in Australia1. Preterm birth is one of the major contributors to infant mortality and morbidity (Lawn *et al.*, 2006; Lawn *et al.*, 2010). Given the high prevalence of psychological disorder in women during pregnancy (Bennett *et al.*, 2004) it is important to understand the relationship between psychosocial risk factors and preterm birth. The etiologic contribution of psychosocial processes during pregnancy and preterm birth remain elusive as findings of studies examining the association between stress or depression and preterm birth have not been consistent. The varied concepts and models and tools used to define stress (e.g., negative life events, perceived stress, subjective feelings of anxiety, daily hassles) and depression (e.g., thought patterns, symptoms of depression), contributes to the lack of clarity about the association between psychosocial characteristics factors and preterm birth. Cortisol, which is referred to as the "stress hormone", is activated in response to stress and depression and can be measured in blood, saliva or urine (Giurgescu, 2009). The increased secretion of CRH, ACTH, and cortisol stimulate prostaglandin secretion which is responsible for the contraction and dilation of the smooth muscle which may lead to preterm labor and premature rupture of membrane (Ruiz*etal.*,2001; Ruiz and Avant, 2005; Kramer and Hogue, 2009).

The terms miscarriage and abortion are synonymous and denote the expulsion of the fetus before the age of viability or before the end of 24th week. Missed miscarriage is defined as pregnancy failure which is identified before expulsion of fetal and placental tissues in less than 24 weeks gestation, as after the 24th week of pregnancy the fetus is considered to be viable. It is estimated that between 10 and 15 percent of confirmed pregnancies end in miscarriage, and that 25 per cent of women will experience an early pregnancy loss in their reproductive lifetime.1 Each year about 30-million induced miscarriages are carried out, emphasizing the need of a safe and effective way of

making it a global issue for the gynecologists and the patients (Bergsjø, 2003; Monaghan *et al.*, 2008).

METHODS

Study Area

The study was conducted in district Karak, Khyber Pakhtoon Khwa. District headquarters hospital and a number of clinics in district Karak were selected. The health care providers in hospital and clinics were interviewed through a questionnaire to collect data about their perceptions regarding delivery, caesarian section and miscarriages. The data was collected from 2015 to 2020.

PatientsandMethods

The observational cohort study used data of all delivery, caesarian section and miscarriages cases registered during 2015 to 2020 in District headquarter hospital and a number of clinics in district Karak. We included all women who underwent the procedure during this time. However, given the geographical diversity of the patients attending the units and hospitals, it was difficult to follow up all pregnancy outcomes. As part of the policy, every referred woman to the District headquarter hospital and a number of clinics in district Karak is requested to sign consent to allow the use of their information with confidentiality. In addition to the demographic characteristics, we noted the main indications of or the procedure, which included: Advanced maternal age and previous history. Data was collected from the hospital register and was tabulated year wise. The patients were also categorized according to the age and were reported.

Statisticalanalysis (Ullah, Islam et al. 2021)

Data was expressed in tables and percentages were calculated. Year wise variation in number of patients and age wise variations linear regression were analyzed by. P value < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Pakistan is distinguished by the inconsistency between the magnitude of the recent decline in average family size and the relatively low level of contraceptive use. The proportion of married women using a modern contraceptive method increased from 9 percent in1990–91 to 20 percent in 2000–01. A further discrepancy, between contraceptive use and fertility desires women's desire to postpone the next birth or to stop having children is seen in the high level of unmet need for family planning. The proportion of currently married women who are fecund and not practicing contraception but who do not want to be pregnant stood at 33 percent in 2000–01, according to the Pakistan Reproductive Health and Family Planning Survey 2000–2001 (NIPS2001). Consistent with these findings is the trend in unplanned childbearing (the combination of unwanted births and mistimed births): the proportion of recent births that are unplanned rose from 21 percent in 1990– 91 to 28 percent in 1996–97 and to 35 percent in 2000–01. These indicators unmet need for contraception and the proportion of births that are unplanned confirm that a large proportion of currently married women in Pakistan are at risk of experiencing an unwanted pregnancy and, potentially, of undergoing an abortion. A high rate of induced abortion is also a plausible explanation for the apparent inconsistency between the persistent low levels of contraceptive use and the rapid decline in family size. A rise in both contraceptive use and abortion rates has been observed in other countries, including Korea, that are experiencing fertility decline (Marston and Cleland, 2003). In this study rate of normal vaginal delivery, caesarian section and miscarriage were reported. As well as age dependent data was collected from district headquarter hospital and clinics for the duration of 5 years. Data was collected from the hospital and clinics registers and were used for the determination of rate of delivery, Caesarian section and miscarriages.

In 2015 total number of cases reported were 1241 in headquarter hospital district Karak. Out to total cases of normal delivery were 63% followed by caesarian section (28%). In 2015 ratio of delivery before time and miscarriage were 2.8% and 6% respectively.

In 2016, total case reported in hospital were 1373 out of which 6.4% were of miscarriage, 3.49% 27.02 percent Caesarian section, 3.49 % delivery before normal birth time while 63% were normal delivery cases. The global prevalence of preterm birth is 9.6%. The rate of preterm birth in Pakistan is 15·7% where a sit is 6·6% in Australia1. Preterm birth is one of the major contributors to infant mortality and morbidity (Lawn *etal.*, 2006;Lawn *etal.*, 2010). Given the high prevalence of psychological disorder in women during pregnancy (Bennett *et al.*, 2004) it is important to understand the relationship between psychosocial risk factors and preterm birth. The etiologic contribution of psychosocial processes during pregnancy and preterm birth remain elusive as findings of studies examining the association between stress or depression and preterm birth have not been consistent. Although many studies demonstrate an association (Erickson *et al.*, 2001; Dayan *et al.*, 2006; Liu *et al.*, 2013) others suggest that racial disparity (Ruiz*etal.*,2001; Kramer and Hogue,2009; Culhane and Goldenberg, 2011) is an underlying factor.

In 2017 total cases reported in district headquarter hospital were 1189 with percentages of 68.29, 21.53, 3.28 and 6.89 % cases of normal delivery, Caesarian section, delivery before normal birth time and miscarriages cases respectively. The rates of normal delivery in district headquarter hospital Karak in 2018 were 67.53% out of total 1500 cases. Numbers of caesarian section were 23.20% and cases of delivery before normal birth time and miscarriages were 2.86 and 6.40% respectively.

In 2019 total cases reported were 1584 in district head quarter hospital while 1931 cases were reported in 2020. Percentage of normal delivery in 2019 and 2020 were 66% and 61% respectively. Cases of caesarian section delivery were 25.94% and 29.93% respectively in 2019 and 2020 while delivery before normal birth time cases reported in 2019 were 3.26%. Cases of delivery before normal birth time in 2020 were 3.26%. In 2019 percentage of miscarriage was 5.30% while it was 5.59% in 2020.

In the general population, almost 15-20% of the total pregnancies undergo into miscarriage, among them 5% experience consecutive two or more pregnancy loss while 0.5-2.3% have consecutive three or more pregnancy loss (Mukhopadhyay *etal.*, 2017; Rasmark Roepke *etal.*, 2017). Most of the mare spontaneous while a few are induced. Sometimes the women undergo miscarriage without being conversant of the fact that she is being conceived so the exact frequency of miscarriages is still unknown (Rai and Regan, 2006; Stephenson and Kutteh, 2007). Among all the miscarriages the dominant to near those which involve the chromosomal aberrations (Slama *etal.*, 2005). There are many risk factors which are unverified or controversial. Increased age of mother, history of previous miscarriage and obesity are those factors which are well established, while paternal age, infertility and parity are those risk factors which are complicated and still not evidently understood. It has been reported that some social risk factors and several behavioral factors are increasing the risk of miscarriage, but most of these are still unverified.

Table 1. Number of Normal vaginal Delivery, Caesarian section, Delivery before normal time, and Miscarriages in clinics of District and District head quarter hospital District Karak

Hospital/ Clinic	Year	Normal Delivery	Age (%)	Caesarian section	Age (%)	Delivery before normal time	Age (%)	Mis-carriage	Age (%)	Total cases
District head quarter hospital District Karak	2015	782	63,01	348	28,04	35	2,82	76	6,12	1241
	2016	866	63,07	371	27,02	48	3,49	88	6,4	1373
	2017	812	68,29	256	21,53	39	3,28	82	6,89	1189
	2018	1013	67,53	348	23,2	43	2,86	96	6,4	1500
	2019	1047	66,09	411	25,94	42	2,65	84	5,3	1584
	2020	1182	61,21	578	29,93	63	3,26	108	5,59	1931
	Total	5702		2312		270		534		8818
Clinics of District	2015	678	69,2	222	22,7	25	2,6	55	5,6	980
	2017	423	67,1	107	17	25	4	75	11,9	630
	2018	723	68	267	25,1	23	2,2	50	4,7	1063
	2019	433	50,7	337	39,5	19	2,2	65	7,6	854
	2020	245	39,1	256	40,9	47	7,5	78	12,5	626
	Total	3035		1501		174		368		5078

According to the age, mothers were classified in to three categories which included 15-20 years age, 20-30 years age and 30-40 years age. Delivery types were further expressed according to the age.

Age dependent distribution of normal delivery cases are presented in table 3.Normal delivery cases were maximum in the age group of 20to 30years of age.

Cesarean sectioned deliveries in district Karak showed an increasing trend from 2015 to 2020. Linear regression showed a regression value of 0.32 (15-20 years age), 0.42 (20-30 years of age) and 0.37 (30-40 years of age). This Linear regression was not statistically significant.

An increase in the number of cases of delivery before time (8^{th} month of pregnancy) was observed in the 20-30 years old age group. Linear regression was used to compare the difference which showed R2 values of 0.13, 0.61 and 0.072 in 15-20, 20-30 and 30-40 years age groups respectively. The Linear regression was significant ($P<0.05$) in 20-30 years old age group.

Miscarriage cases in different age groups are presented in table. Significant positive Linear regression (0.77) and significant increase ($P<0.05$) in age group of 15-20 years. Other groups showed no significant Linear regression from 2015 to 2020. There are many risk factors which are unverified or controversial. Increased age of mother, history of previous miscarriage and obesity are those factors which are well established, while paternal age, infertility and parity are those risk factors which are complicated and still not evidently understood. It has been reported that some social risk factors and several behavioral factors are increasing the risk of miscarriage, but most of these are still unverified. The main examples are smoking, caffeine in take and alcohol consumption that cause DNA fragmentation (Winkle*etal.*,2009;PatkiandChauhan, 2016). There is also a contradiction on the effect of vitamin supplementation, particularly folic acid, on risk of miscarriage, but there are few studies that have accustomed for mystifying support a protective effect (Serapinas *et al.*, 2017).

Tablo 2. Age dependent distribution of normal delivery, Caesarian section, Delivery Before time and Miscariage in District Karak

	Ages	Year						Linear regression R^2
		2015	2016	2017	2018	2019	2020	
Normal Delivery	15-20	245	267	320	317	367	345	
	20-30	514	486	503	445	532	542	
	30-40	701	646	412	974	581	540	
	Total cases	1460	1399	1235	1736	1480	1427	
Caesarian section	15-20	302	388	176	224	312	567	0.32
	20-30	185	176	134	204	259	225	0.42
	30-40	83	119	53	187	177	142	0.37
	Total cases	570	683	363	615	748	834	
Delivery Before time	15-20	30	38	27	22	31	47	0.13
	20-30	15	17	13	20	25	22	0.614
	30-40	15	28	24	24	5	41	0.072
	Total cases	60	83	64	66	61	110	
Miscariage	15-20	93	78	95	102	111	124	0.77
	20-30	5	15	23	10	12	22	0.23
	30-40	33	40	39	34	26	40	0.02
	Total cases	131	133	157	146	149	186	

CONCLUSIONS

From the results of the present study, it is concluded that rate of ceasarian section is increasing from 2015 onward due to the increased cases admitting into clinics. This increase is not age dependent. The rate of miscarriage is dependent upon age and is high in the women with 15-20 years of age and in the women with age above 30 years. Similarly, delivery before time is also increasing in different age groups since 2015 suggesting that the risk factors related to this increase should be determined in pregnant women for normal healthy delivery. This early data provides basis for more studies to be done in district Karak in order to determine the factors associated with the rise in pregnancy loss and caesarian section deliveries in district Karak.

Conflict of Interest Disclosure

The authors declare no conflicts of interest.

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