Risks and complications associated with twin pregnancies. Evidence from WHO multi country survey 2011.

Tahmina Yousaf[1], Syeda Batool Mazhar[2]

ABSTRACT

Objective: To compare the proportion of Twin pregnancies in different areas of Pakistan, also compare the obstetric outcomes in twins and singleton pregnancies

Study Design: Observational, Cross-Sectional Study

Place and Duration: This study was conducted at MCH Center, PIMS. Islamabad, from 1st March 2010 to 30th May, 2011.

Methodology: This is a part of WHO Multi-Country survey 2011. In this study we randomly selected 7 Health facility centers from Punjab and Sindh (The big provinces of Pakistan) and 2 Health facility centers from Islamabad. Hospitals with minimum of 1,000 deliveries per year were selected to participate. All pregnant women, who met our inclusion criteria, were enrolled during the study period. One sample t-test was used to predict the incidence of twin pregnancies in different region. Chi square test was used to test the association between incidence of twin pregnancies and area.

Results: The proportion of twin pregnancies was significantly high in Islamabad as compared to other areas with p value 0.000. There was significant association between twin pregnancies and severe maternal outcome with p value of 0.000. Highest maternal mortality was observed in Punjab (0.4%). Significant association was seen between maternal mortality and geographical area with p value of 0.04.

Conclusion: Twin pregnancies are associated with more pregnancy complications and poorer neonatal outcome as compared to singleton.

Keywords: Twin pregnancy, Singleton pregnancy, Maternal outcome, Perinatal outcome, WHO, Multi country survey. Maternal near-miss.

How to Cite This:

Yousaf T, Mazhar SB. Risks and complications associated with twin pregnancies. Evidence from WHO multi country survey 2011. Isra Med J. 2019; 11(2): 81-85.

INTRODUCTION

Twin pregnancies complicate 2-3% of all births and number is gradually increasing every year[1,2]. Easy availability and injudicious use of ovulation induction agents, advances and expertise in assisted reproduction and delayed child bearing has resulted in rising incidence of higher order multiples[3,4]. In United States of America, incidence of higher order multiples has increased by 59% between 1988 to 1999, with twins accounting for 94% of all[5].

World Health Organization estimates that 99% world's annual maternal deaths occur in developing countries[6,7]. Twin pregnancies are associated with increased obstetric and perinatal complications which are aggravated further due insufficient care during pregnancy and delivery and scarcity of human and material recourses in developing countries.

The main causes of adverse maternal outcome are anemia, postpartum hemorrhage, hypertensive disorders of pregnancy and increased risk of operative delivery while the major causes of poor neonatal outcome are prematurity, increased incidence of intra uterine growth restriction, fetal anomalies, low birth weight and problems related to monochorionic twins[8,9].

Recent advances in obstetric and neonatology have been unsuccessful in reducing the morbidity and mortality related to twins, to any significant extent. Countries belonging to low socioeconomic group like Pakistan have higher percentage of adverse outcomes in twin pregnancies due to limited resources as compared to developed countries. In addition, there are

1. Associate Professor of Gynecology, Federal General Hospital, Chak Shahzad, Islamabad.
2. Professor of Obstetrics and Gynecology, MCH Centre Unit I, Pakistan Institute of Medical Sciences, Islamabad, Pakistan.

Correspondence to:
Tahmina Yousaf
Associate Professor of Gynecology,
Federal General Hospital, Chak Shahzad, Islamabad.
Email: tahmina.farrukh@yahoo.com

Received for Publication: 08-11-17
1st Revision of Manuscript: 07-01-18
2nd Revision of Manuscript: 19-10-18
3rd Revision of Manuscript: 02-11-18
4th Revision of Manuscript: 26-11-18
5th Revision of Manuscript: 02-01-19
6th Revision of Manuscript: 15-04-19
Accepted for Publication: 19-04-19

certain social, financial and personal implications for the families taking care of women with twin gestation[10,11].

Purpose of this study is to determine the incidence of twins and compare the obstetric outcomes of twin pregnancies in comparison with singleton along with study of regional variations. Study of regional variations was planned to identify the areas that are high risk in terms of poor maternal and perinatal outcomes. This analysis will help the policy makers to focus on the provision of standard maternity services in those regions where inequities exist in access to health services reflecting the gap between the rich and poor. Findings of this study will also help to address the limitations in our available literature about twins as well as in the management and care of twin gestation thus improving the obstetric outcomes[12]. we have conducted this study to compare the obstetric outcomes in twins and singleton pregnancies along with quantification of regional variations in the WHO Multi-country Survey 2011. The objective of our study is to compare the proportion of Twin pregnancies in different areas of Pakistan, also compare the obstetric outcomes in twins and singleton pregnancies

METHODOLOGY

This descriptive, cross-sectional study was conducted at Maternal and Child Health Centre, PIMS, Islamabad and data was also collected from three different areas of Pakistan namely Punjab, Sindh and Islamabad. Total 16 Institutes were randomly selected (7 from each province and 2 from Islamabad), having over 1,000 births per year and able to perform caesarean sections. All pregnant women, who presented in the selected health facility center between 1st March to 31st May 2011 and delivered after 28 weeks of gestation were included in the study after taking informed consent. Women having higher order multiples and those delivering before 28 weeks were excluded from the study. The primary outcome measures were the incidence of twin pregnancy, severe maternal outcome and maternal near miss (MNM). Secondary maternal outcome measures were maternal near miss, postpartum hemorrhage, hypertensive disorders and preterm delivery. The perinatal outcomes were Apgar scores, birth weights and admission to NICU. This analysis also included quantification of regional variations as well as socio demographic characteristics of study population.

Data Analysis: Data was collected through manual questionnaire by a trained health professional. Data was retrieved from WHO Multi Country survey and was analyzed on SPSS version 23. Frequencies and percentages were calculated for categorical variables. One sample t-test or binomial test was used to test the proportion of twin pregnancies in different areas. Chi-square test was used to compare the proportion of twin pregnancies between different areas. Statistical significance was attributed to $P \leq 0.05$.

Operational Definitions:

Severe Maternal Outcome: According to WHO, Severe Maternal outcome (SMO) is defined as maternal death or morbidity with organ dysfunction occurring within 7 days of delivery or abortion.

Maternal near-miss (MNM). It is defined as 'a women who nearly died, but survived a complication that occurred during pregnancy, child birth or 42 days of termination of pregnancy.

RESULTS

A Total of 13157 women were enrolled in the study. 11 women were dropped due to uncomplete questionnaire, final analysis was performed on 13146 samples. Out of 13146 women 6243 (47.5%) were from Punjab, 3782 (28.8%) were from Sindh and the remaining 3121 (23.7%) were taken from Islamabad. The distribution of other demographic variables were mentioned in Table-I.

Overall 12969 (98.7%) were singleton pregnancies whereas remaining 177 (1.3%) were twin pregnancies. So incidence of twin pregnancy was 1.6%. Highest number of twin pregnancies was observed in Punjab as 96 (1.5%) followed by Federal capital (1.3%) and Sindh (1.1%), with p value 0.151. (Table-I)

Table-I: Frequencies of demographic variables (N=13146)

Variable	Categories	Type of Pregnancy		Total n (%)	P value
		Singleton	Twin		
Regions	Punjab	6147 (98.46%)	96 (1.54%)	6243 (47.5%)	0.151
	Sindh	3741 (98.92%)	41 (1.08%)	3782 (28.8%)	
	Islamabad	3081 (98.72%)	40 (1.28%)	3121 (23.7%)	
Maternal age in years	Less or equal to 20	518 (99.42%)	3 (0.58%)	521 (4.0%)	0.247
	Between 20 to 40	12425 (98.62%)	174 (1.38%)	12599 (95.8%)	
	More than 40	26 (100%)	0 (0%)	26 (0.2%)	
Gestational age in weeks	Less or equal to 37	1388 (94.29%)	84 (5.71%)	1472 (11.2%)	0.000
	More than 37	11581 (99.20%)	93 (0.8%)	11674 (88.8%)	
Gravidity	Primi-gravida	4098 (98.79%)	50 (1.21%)	4148 (31.6%)	0.341
	Multi-gravida	8871 (98.59%)	127 (1.41%)	8998 (68.4%)	
Parity	Primi-para	4458 (98.74%)	57 (1.26%)	4515 (34.3%)	0.546
	Multi-para	8511 (98.61%)	120 (1.39%)	8631 (65.7%)	
Mode of Delivery	Vaginal delivery	8456 (98.76%)	106 (1.24%)	8562 (65.1%)	0.141
	Cesarean section	4513 (98.45%)	71 (1.55%)	4584 (34.9%)	

There was significant association between "different region" and "maternal age" with p value 0.000 as the proportion of women having age less or equal to 20 years was observed 5.9% in Sindh, 4.5% in Islamabad and just 2.5% in Punjab. Similarly there is also significant association between "different regions" and "mode of delivery" as the proportion of C-section was observed as high as 59.2% in Punjab, then 13% in Islamabad and 12.7% in Sindh with p value 0.000. It is also observed that the proportion of preterm birth (having gestational age <37 weeks) is higher with twin pregnancies (47.5%) vs singleton (10.7%) with p value 0.000.

There is significant difference in twin and singleton pregnancies regarding maternal severe outcome, maternal mortality and postpartum hemorrhage (PPH) with p value 0.000 in each case. The detail comparison of maternal outcome with respect of type of pregnancy in mentioned in Table-II.

Table-II: Maternal outcome in twin and singleton pregnancies (N=13146)

Maternal out come	Twins (n=177)	Singleton (n=12969)	p-value
Maternal severe outcome	8 (4.5%)	106 (0.8%)	0.000
	169 (95.5%)	12863 (99.2)	
Maternal near miss	3 (1.7%)	78 (0.6%)	0.096
	174 (98.3%)	12891 (99.4%)	
PPH	13 (7.3%)	204 (1.6%)	0.000
	164 (92.7%)	12765 (98.4%)	
Hypertension	8 (4.5%)	277 (2.1%)	0.059
	169 (95.5%)	12692 (97.9%)	
Pre-eclampsia	3 (1.7%)	155 (1.2%)	0.474
	174 (98.3%)	12814 (98.8%)	
Eclampsia	2 (1.1%)	54 (0.4%)	0.174
	175 (98.9%)	12915 (99.6%)	
Maternal vital status at discharge			
Alive	172 (97.2%)	12941 (99.8%)	0.000
Dead	5 (2.8%)	28 (0.2%)	

Table-III: Perinatal outcome in twin and singleton pregnancies (N=13146)

Perinatal outcome	Twins (n=177)	Singleton (n=12969)	p-value
Apgar score			
< 5	10 (5.6%)	248 (1.9%)	0.003
> 5	167 (94.4%)	12721 (98.1%)	
Birth weight			
LBW	117 (66.1%)	1544 (11.9%)	0.000
Normal	60 (33.9%)	11425 (88.1%)	
Admission to NICU			
Yes	41 (23.2%)	897 (6.9%)	0.000
No	136 (76.8%)	12072 (93.1%)	
Newborn status at discharge			
Alive	168 (94.9%)	12696 (97.9%)	0.014
Dead	9 (5.1%)	273 (2.1%)	

It is also observed that incidence of different perinatal outcomes have association with twin pregnancy, as the proportion of low Apgar score, low birth weight, admission to NICU and newborn mortality is significantly high in women having twin pregnancy at 5 % level of significance. The detail comparison is in Table-III.

DISCUSSION

Incidence of twins varies widely in different regions of the world, being highest in west Africa and lowest in Asian Mongolians[13,14]. In the present study it was 1.3% that was incongruent with that reported in earlier studies by Mazhar SB in 2006 and Akhtar S in 1996[15,16]. It was reported even higher as it was 1.5% in UK, 1:80 in Northern America and 1:100 in Saudi Arabia[17,18]. Therefore, incidence of twin pregnancy varies among different races and ethnic groups, reflecting the role played by genetic influences.

Comparing the markers such as severe maternal outcome and maternal near miss, it was observed that twin pregnancies were more likely to have severe maternal outcome than singleton pregnancies (4.3% vs 0.8%) respectively. Similarly, maternal near miss was (1.6% vs 0.6%) in the present study. These findings were consistent with previous literature (9.6 vs 3.5%) and were statistically significant[19,20]. However the extent to which this risk was due to environmental factors in low-resource settings or the intrinsic risk of twin pregnancy itself, remains unclear[21,22].

Postpartum hemorrhage was experienced by 12(6.8%) women having twin pregnancy as compared to 204 (1.6%) singleton pregnancies (p-value = <0.001) which corroborates the findings from earlier reports by Chowdhury et al(18.6%) that women with multiple gestations are at increased risk of postpartum hemorrhage[23-25]. Studies in developed countries had shown estimated relative risk of postpartum hemorrhage of 3.0% to 4.5% in twin pregnancies, which is much lower than that seen in our analysis so, this complication is still a deplorable condition in our country[26].

Overall hypertensive disorders were found in (7% vs 3.6%) in the present study that was not statistically significant, however incidence of hypertensive disorders was found significantly higher in women that had twin pregnancies than in their singleton counterparts (15% vs 6% respectively) in the present study. Similar results were reported in a case–control study by Santana and colleagues and Reddy and Madhavi et al. (14% vs 7%)[13,27]

Regarding the neonatal outcomes, the common fetal complications observed were that the twins had comparatively lower birth weight than singleton. The incidence of having a baby with a low birth weight (less than 2500 grams) was 66.5% in twins as compared to 11.9% in the singleton in the present study ,which was statistically significant and much higher than reported (51.3%) by Australia's Mothers and Babies, AIHW, 2011 for twin pregnancies[28]. Another study by Bangal VB et al showed that 84% of twins had low birth weight as compared to singleton, which was even higher than the findings of our study[29].

The majority of twins appear to be born around thirty-seven weeks and incidence of preterm delivery varies among populations from 30-50%. The incidence of preterm delivery in

present study was (47%) in comparison to (44%) reported by Radhakrishnan R et *al*.[30] In Australia (Australia's Mothers and Babies, AIHW, 2011), the overall rate of preterm birth with twins was 52.2%, which was slightly higher than ours.

Significant number of twins had low Apgar score and admission to NICU in the present study and it was supported by Rizwan Nand et al[31]. The increased rate of perinatal deaths observed in twin pregnancies may be explained by the increased rate of intrauterine growth restrictions, premature rupture of membranes, preterm deliveries, low birth weight, and low Apgar scores among the twin deliveries. The higher perinatal mortality observed in this study signifies the overall increased rate of premature births in the twins group.

Poor perinatal outcome in terms of low birth weight, low Apgar score, admission to NICU and increased perinatal mortality with twin pregnancies were almost similar in all three provinces, however percentage of postpartum hemorrhage was significantly higher in Sindh, which may be explained by limited health infrastructure and low socioeconomic situation in the interior of Sindh.

LIMITATIONS

This study has certain limitations that should be noted. Although sample size was quite large and it covered big provinces/area of Pakistan but data did not cover the entire country. So it is necessary to expand the study to include missing areas to calculate more accurate estimates regarding incidence of twin pregnancies and their related problems.

There is notable dearth of reliable data regarding multiple gestations in Pakistan so this study still helps us to clear the picture. It is hoped that in light of these findings, periodic reviews will be carried out in the near future and some modalities will be put in place to reduce the morbidity and mortality associated with twin gestation in our country.

CONCLUSION

Twin pregnancies are associated with more pregnancy complications and poorer neonatal outcome as compared to singleton. They are not associated with any specific area.

CONTRIBUTION OF AUTHORS

Yousaf T: Data collection and compilation, Literature review
Mazhar SB: Conception and design of study, Data analysis, Manuscript writing, Final critical review of manuscript

Disclaimer: None.
Conflict of Interest: None.
Source of Funding: None.

REFERENCES

1. Naheed I. Zaineb A, Almas S. Twin pregnancy (high risk for the mother and the fetus). Pak Postgrad Med J. 2001; 12:50–54.
2. La Sala GB, Gallinelli A, Nicoli A, Villani MT, Nucera G. Pregnancy loss and assisted reproduction: preliminary results after the law 40/2004 in Italy. Repro Biomed Online 2006; 13(1):65–70.
3. Child TJ, Henderson AM, Jan Tan SL. The desire for multiple pregnancy in male and female infertility patients. Hum Repro 2004; 19:558–61.
4. Bangahs N. Outcome of twin pregnancy in un-booked cases. Pak Arm Forc Med J. 2005; 55:323–26.
5. Russell RB, Petrini JR, Damus K, Mattison DR, Schwarz RH. The changing epidemiology of multiple births in United States. Obstet Gynecol 2003; 101(1):129-35.
6. World Health Organization, UNiCEF, UNFPA, World Bank (2012) Trends in Maternal Mortality: 1990 to 2010. World Health Organization. Website [http://www.who.int/reproductivehealth/publications/monitoring/9789241503631/en/]
7. UNiCEF, World Health Organization, World Bank, United Nations (2012) Levels and Trends in Child Mortality Report 2012.UNICEF. Website: [http://www.who.int/reproductivehealth/publications/monitoring/9789241503631/en/]
8. Leftwich HK, Zaki MN, Wilkins I, Hibbard JU. Labor patterns in twin gestations. Am J Obstet Gynecol. 2013; 209(3):1–5.
9. Patel F, Hall DR. Twin pregnancies, risks and complications: a review article. Obstetrics and Gynecology Forum. 2004; 14(3):13–19.
10. Rao A, Sairam S, Shehata H. Obstetric Complication of twin pregnancies.Best Pract Res Clin Obstet Gynaecol. 2004; 18(4):557–76.
11. Onyiriuka AN. Twin delivery, comparison of incidence and fetal outcome in Health Institutions in Benin City, Nigeria. Nig Q J Hosp Med. 2003; 16(3):88–92.
12. Onwuzuruike BK, Onah HE. Caesarean section in twin pregnancies in Enugu, Nigeria. J of Coll of Med. 2004; 9(1):8–11.
13. Santana DS, Cecatti JG, Surita FG. Twin pregnancy and severe maternal outcome: The World Health Organization Multicountry survey on maternal and newborn health. Obstet Gynecol 2016;127(4):631-41
14. Mutihir JE, Pam VC. Obstetric outcome of twin pregnancies in Jos,Nigeria: a 16 month review in Jos University Hospital, Nigeria.NigerJ Clin Pract. 2007; 10(1):15–18.
15. Mazhar SB, Rahim F, Furukh.T. Fetomaternal Outcome in Triplet Pregnancy. J Coll Phys & Surg Pak 2008; 18:217–21.
16. Georgina M, Van PH, Elizabeth A et al. Hospital cost of multiple-birth and singleton- birth children during first 5 years of life and the role of assisted reproductive technology. JAMA Pediatr 2014;168 911 0:1045-53
17. Bush MC, Pernoll ML. Multiple Pregnancy. In: De cherney AH editor). Current Diagnosis Treatment in Obstetrics and Gynecology.10th edition. New York: McGraw-Hill Medical Publishing Division.2007:310.
18. Martin JA, Hamiton BE, Ventura SJ, Osterman MJ, Mathew TJ. Births; final data for 2011. Natl Vital Stat Rep.2013;62(1):1-69

19. Sibai B, Hauth J, Caritis S, Lindheimer M, MacPherson C, et al. Hypertensive disorders in twin versus singleton gestations. Am J Obstet Gynecol. 2000; 182: 938–42
20. Singh L, Trivedi K. Study of maternal and fetal outcome in twin pregnancy. Int J Reprod Contracept Obstet Gynecol. 2017; 6:2272-278.
21. Gyamfi C, Stone J, Eddleman K. Maternal complications of multi fetal pregnancy. Clin Perinatol 2005; 32: 431–42.
22. Chowdhury S, Hussain, M. A. 2011.Maternal complications in twin pregnancies. Mymensingh Med J. 2011; 20(1):83-87.
23. Panday S, Shetty A, Hamilton M, Bhattacharya S, Maheshwari A. Obstetric and perinatal outcomes in singleton pregnancies resulting from IVF/ICSI; a systemic review and meta-analysis. Hum Reprod Update.2012;18(5):485-503
24. Jon FR, Marry E, Hannah, Eileen K, Andrew R et al. A randomized trial of planned cesarean or vaginal delivery for twin pregnancy. N Engl J Med. 2013;369:1295-305
25. Chowdhury S, Hussain MA. Maternal complications in twin pregnancies. Med Marij J. 2011; 20(1):83-87.
26. Enid SC, Gileard, M, Pendo M, Joseph O, Michael JM. Maternal outcome in multiple versus singleton pregnancies in NorthernTanzania: A registry-based case control study. Asia Pacf J of Reprod. 2014; 3(1):46-52.
27. Reddy MA, Madhavi KSS, Niharica. A study on risk of twin pregnancy. Int Archi of Integ Med. 2016; 3(10):139-45.
28. Australia's Mothers and Babies, AIHW, 2011. Perinatal statistics series no. 25 Dec11. Australian Institute of Health and Welfare Canberra. Cat no. PER 52
29. Bangal VB, Patel SM, Khairnar DN. Study of maternal and foetal outcome in twin gestation at tertiary care teaching hospital. Ind J Basic and App Res. 2012; 3(10):758.
30. Radhakrishnan R. Perinatal outcome of twin pregnancy and influence of chorionicity on it. Int J Prev Therapeu Med. 2014; 2(1):10-4.
31. Rizwan N, Abbasi MR, Mughal R. Maternal Morbidity and Perinatal Outcome with twin pregnancy. J Ayub Med Coll Abbottabad. 2010;22(2):105-107