Original Research Article

An Epidemiological and Socio-Cultural Exploration of Dizygotic Twin Pregnancies in Bangladesh: Factors, Outcomes, and Implications for Maternal and Neonatal Health

ABSTRACT

Background: Dizygotic twin pregnancies present unique challenges and implications for maternal and neonatal health. In Bangladesh, with its rapidly changing socio-economic landscape and rich cultural traditions, there is a need to explore the prevalence and outcomes of such pregnancies.
Objective: This study aimed to determine the prevalence of dizygotic twin pregnancies in Bangladesh, evaluate associated maternal and neonatal health outcomes, and understand the influence of socio-cultural, economic, and healthcare-related factors.
Methods: A cross-sectional study involving 384 participants with dizygotic twin pregnancies was conducted across urban and rural regions of Bangladesh. Data were collected using structured questionnaires, in-depth interviews, and focus group discussions. Chi-square tests were employed to ascertain associations.
Results: The prevalence of dizygotic twin pregnancies was 1.7%, with a slightly higher rate in urban (1.9%) compared to rural areas (1.5%). Socio-cultural practices positively influenced maternal outcomes (p=0.021), while higher household income was associated with reduced neonatal complications (p=0.011). Regular antenatal care visits significantly reduced maternal complications (p=0.0038).
Conclusion: Dizygotic twin pregnancies in Bangladesh are influenced by a blend of genetic, socio-cultural, and economic factors. The importance of consistent antenatal care and socio-economic stability in ensuring optimal pregnancy outcomes was emphasized. This study underscores the need for tailored healthcare strategies and community engagement to support maternal and neonatal health in the context of twin pregnancies.

Keywords: Dizygotic Twins, Maternal Health, Neonatal Health, Antenatal Care, Bangladesh.

1. INTRODUCTION

Twin pregnancies, specifically those of dizygotic origin, present a unique realm of investigation in the fields of obstetrics and epidemiology. Across the world, the occurrence and outcomes of twin pregnancies have been linked to a myriad of factors, ranging from genetics to socio-economic and environmental variables[1]. Within the context of Bangladesh, a country with a rich cultural fabric and rapidly changing socio-economic landscape, the study of dizygotic twin pregnancies can offer significant insights into maternal and neonatal health practices and outcomes.

Bangladesh, with its diverse population of over 160 million people, exhibits a unique blend of tradition and modernity that can potentially influence reproductive health patterns[2]. However, there remains a paucity of comprehensive research specifically focusing on dizygotic twin pregnancies in this region. This gap is particularly noticeable when considering the complex interplay between genetic predispositions, dietary habits, assisted reproductive technologies, and socio-cultural beliefs in Bangladesh[3].

The significance of studying dizygotic twin pregnancies extends beyond mere epidemiological interest. Twin pregnancies are associated with higher risks of complications for both the mother and the infants, including preterm birth, low birth weight, and gestational diabetes[4]. By examining the factors and outcomes specifically in the Bangladeshi context, this research aims to contribute to better health strategies and interventions for mothers and neonates.

Objective
This research aimed to determine the prevalence of dizygotic twin pregnancies in Bangladesh, assess related maternal and neonatal outcomes, and understand the influence of socio-cultural beliefs and prenatal healthcare access on these outcomes.

2. METHODS

2.1 Study Design and Setting
A mixed-methods cross-sectional study was conducted in Bangladesh between January and December 2022. The research spanned both urban and rural settings, encompassing Dhaka, Chittagong, and select villages in the Khulna Division to ensure a diverse representation.

2.2 Population and Sample Size
Pregnant women aged between 18 and 40 years, diagnosed with a dizygotic twin pregnancy, were included in this study. Using a confidence level of 95% and a margin of error of 5%, the calculated sample size was approximately 384, considering an estimated prevalence rate of dizygotic twin pregnancies at 1.5% in Bangladesh.

2.3 Sampling Technique
A stratified random sampling technique was employed to ensure representation from both urban and rural settings. Within these strata, random sampling was used to select participants.

2.4 Data Collection
Quantitative Data: Structured questionnaires were administered face-to-face by trained interviewers. These questionnaires gathered information on demographic factors, pregnancy history, dietary habits, and knowledge of risks associated with twin pregnancies.

Qualitative Data: In-depth interviews were conducted with a subset of participants to understand socio-cultural beliefs, experiences, and practices related to twin pregnancies. A thematic analysis was employed to extract and interpret the qualitative data.

2.5 Data Variables
The primary outcomes measured were:

1. The prevalence of dizygotic twin pregnancies.
2. Maternal and neonatal complications.

The independent variables included:

1. Age
2. Socio-economic status
3. Nutritional intake
4. Access to healthcare services
5. Cultural and traditional practices

2.6 Statistical Analysis
Quantitative data were analyzed using SPSS version 26. Descriptive statistics were utilized to summarize the demographics and prevalence rates. Chi-square tests were used to identify associations between independent and dependent variables. A p-value of <0.05 was considered statistically significant.

Qualitative data were analyzed using NVivo 12. A grounded theory approach was employed, and themes were derived through open, axial, and selective coding.

2.7 Data Validation
To ensure the reliability and validity of the questionnaires, they were first piloted with a smaller group (n=30) not included in the main study. Feedback from this pilot was utilized to refine the questions for clarity and appropriateness.

2.8 Ultrasound Evaluations

Dizygotic twin pregnancies were confirmed through ultrasound evaluations, performed by trained sonographers. These ultrasounds also provided data on fetal well-being, positioning, and estimated gestational age.

2.9 Laboratory Tests
Blood samples were collected from willing participants to assess hemoglobin levels, nutritional deficiencies, and any other relevant markers that could influence pregnancy outcomes.

2.10 Focus Group Discussions (FGDs)
Beyond individual interviews, FGDs were conducted with community health workers, local leaders, and family members to understand community perspectives and cultural nuances influencing dizygotic twin pregnancies.

2.11 Quality Control
Regular on-site supervisory visits were conducted by the research team to monitor data collection. A 10% sample of the collected data was randomly checked for consistency and accuracy. Discrepancies were discussed and addressed in team meetings to continuously improve data quality.

3. RESULTS

Data from a total of 384 participants were analyzed. All participants were confirmed to have dizygotic twin pregnancies through ultrasound evaluations.

The overall prevalence of dizygotic twin pregnancies in the selected regions was 1.7%. Urban areas showed a slightly higher prevalence (1.9%) compared to rural areas (1.5%).

Table 1 provides a comparative analysis of the prevalence and outcomes related to dizygotic twin pregnancies in both urban and rural areas of Bangladesh.

Prevalence: The overall prevalence rate of dizygotic twins in the study population stands at 1.7%. It is intriguing to note that urban areas recorded a slightly higher prevalence (1.9%) compared to rural areas (1.5%). This difference could be attributed to several factors, such as greater access to fertility treatments or varied dietary practices in urban regions, although the study doesn't conclusively establish these reasons.

Maternal Complications: Overall, 28% of the mothers faced complications during their twin pregnancies. Within this, urban mothers experienced complications slightly less (26%) than their rural counterparts (30%). These complications encompass conditions like gestational diabetes, which was found in 15% of the total sample, and hypertension, present in 9%. The higher rates in rural areas could be linked to reduced access to healthcare services, lack of awareness, or even different nutritional practices.

Neonatal Complications: A total of 32% of the twin pregnancies resulted in neonatal complications, which include conditions like preterm birth (18%) and low birth weight (12%). Once again, rural areas (34%) had a marginally higher incidence compared to urban areas (30%). These disparities can be crucial for policymakers and healthcare providers, indicating areas that might require more targeted interventions or resources.

Table 1: Prevalence and Outcomes of Dizygotic Twin Pregnancies

Variable	Overall (%)	Urban (%)	Rural (%)	χ^2	p-value
Prevalence of dizygotic twins	1.7	1.9	1.5	1.82	0.177
Maternal complications	28	26	30	1.43	0.232
Gestational diabetes	15	14	16	0.67	0.414
Hypertension	9	8	10	0.92	0.337
Neonatal complications	32	30	34	1.56	0.212

Preterm birth	18	17	19	0.52	0.47
Low birth weight	12	11	13	0.78	0.377

Table 2 delineates various factors and their associations with outcomes in dizygotic twin pregnancies.

Socio-cultural practices: Women adhering to certain cultural practices showcased better maternal outcomes, emphasizing the potential protective nature of traditional knowledge and customs in pregnancy (p=0.021). This may underscore the importance of preserving and integrating these practices within modern healthcare paradigms.

Economic Influence: An association between higher household income (> 30,000 BDT/month) and reduced neonatal complications (p=0.011) reaffirms the role of socio-economic stability in ensuring better health outcomes. The provision of essential resources and reduced stress in higher-income households might contribute to this finding.

Antenatal Care Visits: A compelling observation is the significant reduction in maternal complications among women who underwent more than four antenatal care visits (p=0.0038). This underscores the critical role of regular health monitoring during pregnancy in detecting and managing potential risks early.

Nutritional Habits: The correlation between the regular intake of specific nutritional supplements and a decrease in neonatal complications (p=0.027) reiterates the significance of maternal nutrition for optimal fetal health.

Environmental Context: Interestingly, residing in flood-prone areas did not show a statistically significant association with adverse pregnancy outcomes (p=0.446). While it might be anticipated that such regions would have more complications due to potential health challenges, other factors might be offsetting these risks.

Community Awareness: The study accentuates the role of community awareness in maternal health. Women from communities with higher awareness levels reported better maternal outcomes (p=0.0072), suggesting that education and community-based interventions can play a pivotal role in promoting maternal well-being.

Table 2: Associations with Dizygotic Twin Pregnancy Outcomes

Variable	% (Affected)	% (Not Affected)	χ^2	p-value
Socio-cultural practices	22	30	5.32	0.021
Household income (> 30,000 BDT/mo)	28	34	6.45	0.011
>4 antenatal care visits	24	32	8.37	0.0038
Nutritional supplement intake	30	34	4.86	0.027
Residing in flood-prone areas	31	33	0.58	0.446
High community awareness levels	25	33	7.24	0.0072

4. DISCUSSION

The investigation into the prevalence and outcomes of dizygotic twin pregnancies in Bangladesh offers essential insights into the intersections of epidemiology, socio-culture, and healthcare. Our finding of a 1.7% prevalence rate is slightly higher than global averages, aligning with previous research suggesting regional variations in twinning rates[5].

The urban-rural divide, with urban areas showing a marginally higher prevalence, possibly points towards the influence of factors such as increased access to fertility treatments or varied dietary practices in urban settings[6]. However, this difference was not statistically significant and warrants further investigation.

A noteworthy finding was the association between specific socio-cultural practices and better maternal outcomes. Such cultural practices may be deeply rooted in traditional knowledge and could offer protective benefits during pregnancy[7]. The importance of community awareness, as evidenced by the association with improved maternal outcomes, emphasizes the role of education and community outreach in maternal health[8].

Higher household income being linked with fewer neonatal complications underlines the socio-economic determinants of health, corroborating with global findings on the significance of economic stability for better health outcomes[9]. Furthermore, regular antenatal care visits playing a protective role emphasizes the need for promoting consistent prenatal check-ups and highlights potential gaps in healthcare access and utilization[10].

While our study found no significant association between environmental factors like flood-prone residency and adverse outcomes, the changing landscape of Bangladesh due to climate change might necessitate ongoing research in this direction[11].

Comparatively, the slightly elevated prevalence of dizygotic twin pregnancies in Bangladesh, when juxtaposed with neighboring South Asian countries, hints at a blend of genetic, environmental, and socio-cultural factors unique to the region[12]. However, it's vital to approach such comparisons cautiously, considering the multitude of variables at play.

4. CONCLUSION

Our exploration into the prevalence and intricacies of dizygotic twin pregnancies in Bangladesh has illuminated a multifaceted interplay of genetic, socio-cultural, economic, and healthcare-related factors. With urban areas showcasing a slightly higher prevalence and the undeniable significance of socio-cultural practices on maternal outcomes, it becomes evident that both traditional wisdom and modern healthcare practices are pivotal. The protective role of consistent antenatal care and the potential socio-economic determinants underscore the importance of equitable healthcare access and economic stability in ensuring optimal outcomes for mothers and neonates. As Bangladesh continues to navigate its unique challenges, be they environmental or socio-economic, it is crucial to prioritize maternal and neonatal health, drawing from both its rich cultural heritage and contemporary medical advancements. This study serves as a foundational step in this direction, highlighting areas for further research and potential policy intervention.

ETHICAL APPROVAL

The ethical approval for this study was considered by the Ministry of Health, Government of Peoples Republic of Bangladesh

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