RESEARCH ARTICLE

EFFECT OF MATERNAL SOCIOECONOMIC CONDITIONS ON MATERNAL HEALTH INDICATORS AND NEONATAL PARAMETERS IN PAKISTAN

Muhammad Usman1,2,*, Maeesa Wadood1, Muhammad Rizwan1, Moinuddin1, Nida Haque1
1 Baqai Institute of Hematology, Baqai Medical University, Karachi, Pakistan.
2 Muhammedi Institute of Hematology and Transfusion Medicine, Karachi, Pakistan.

ABSTRACT

Infant mortality rate is a serious issue worldwide. Pakistan being a developing country comprises of diverse socioeconomic classes. Various studies have suggested some association of maternal anthropometric parameters with neonatal outcomes. The aim behind this research is to determine the impact of socioeconomic conditions on maternal health indicators and neonatal parameters in the population of Pakistan. This study included 90 pregnant females belonging to different socioeconomic conditions and were grouped according to their socioeconomic classes. Data was collected from the case histories of participants admitted in different hospitals of Karachi. The data of maternal and neonatal parameters was assessed statistically and their associations with the socioeconomic conditions were assessed. Maternal hemoglobin and maternal gravidity have shown a strong association with socioeconomic conditions with high significance ($p < 0.05$). However, neonatal parameters have shown diverse results among the three classes. Neonatal gestational age was found to be significant in comparison between upper versus lower ($p = 0.001$) and upper versus middle classes ($p = 0.006$), but it was insignificant in case of middle versus lower class ($p = 0.88$). Likewise, neonatal birth weight is significant between upper versus lower ($p = 0.001$) and upper versus middle classes ($p = 0.019$), but it was insignificant in case of middle versus lower class ($p = 0.258$). Neonatal apgar score is found to be significant in upper versus lower ($p = 0.001$) and middle versus lower classes ($p = 0.001$) and insignificant between middle and lower class ($p = 0.125$). This study concludes that socioeconomic factors play a vital role in determining the maternal health characteristics which in turn affects the neonatal outcomes. It is therefore recommended that antenatal care should be provided to all pregnant females. The whole community should work in hand to establish good health care centers, create awareness among the population and play a role in resolving the various social and financial issues.

Keywords: Maternal health, neonates, socioeconomic factors, hemoglobin.

1. INTRODUCTION

Pregnancy is a physiological condition that results in various hemodynamic changes influenced by the hormonal and physiological responses of the body1. Infant mortality, the death of child before his/her first birthday, is a major concern worldwide. It is considered to be associated with the health status of whole population of any particular region2. Although a slight decline is observed in the recent past3 but still infant mortality rate is one of the serious issues in Pakistan. According to the latest statistics reported by UNICEF, Pakistan ranked 26th among all the countries with high infant mortality rate i.e. 6.9%. The mean life expectancy of newborn is 66%, with approximately one third being born malnourished4. Neonatal parameters such as gestational age, mode of delivery, neonatal birth weight and neonatal apgar score are determined by maternal health indicators including maternal weight gain during pregnancy, maternal parity, maternal anemia and co-morbidities such as miscarriages, intrauterine fetal death, obstructed labor and pregnancy induced hypertension etc.

* Corresponding Author Email: staytune1@hotmail.com
Society is usually divided into three classes regarding their living standards i.e. upper, middle and lower class. The concept of socioeconomic classes has its roots way back to the era of Karl Marx and Max Weber which considered relationship with means of production and wealth etc. for defining the classes. Poverty is not a new phenomenon in Pakistan as shown by human development report of 2014 issued by United Nations Development Program. According to this report Pakistan has consecutively obtained 146th position out of 187 countries in 2013 and 2014 in terms of human development indices which encompass health, education and living standard. In this study we intended to assess the effects of maternal socioeconomic status on maternal health indicators and neonatal outcomes. This study was designed to search the relationship between the various impact factors of maternal anthropometry and socioeconomic status with the reproductive outcomes. It is very important to take necessary measures by both the public and private health sector to rectify this problem.

2. METHOD
This research was designed to collect data regarding maternal health and neonatal birth outcomes from pregnant females belonging to different socioeconomic classes. The study was conducted in different hospitals of Karachi.

A hypothesis was assumed that “neonatal parameters at birth are influenced by maternal socioeconomic status in Pakistan”. To achieve the goal, 90 pregnant females were selected. They were grouped into three different classes, upper, middle and lower, 30 in each group according to their socioeconomic status. Data was collected from the case histories about the maternal characteristics and neonatal parameters. It was then assembled accordingly for each class on Microsoft Office Excel 2007. Descriptive analysis was done on SPSS version 17.0. Mean and standard deviation of the assessed parameters were used for statistical analysis. Maternal health determinants and the neonatal parameters were compared using paired student t-test. p value of less than 0.05 was considered significant.

3. RESULTS AND DISCUSSION
Based upon the socioeconomic status of the pregnant females, all participants were recruited into three different classes i.e. upper, middle and lower class. The descriptive data is given in Tables 1 and 2.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters</th>
<th>Upper class (p value)</th>
<th>Middle class (p value)</th>
<th>Lower class (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maternal hemoglobin (g/dl)</td>
<td>12.3 ± 0.87 (0.001)</td>
<td>10.6 ± 0.86 (0.001)</td>
<td>9.6 ± 1.18 (0.002)</td>
</tr>
<tr>
<td>2.</td>
<td>Maternal gravidity</td>
<td>1.9 ± 1.1 (0.001)</td>
<td>2.4 ± 1.25 (0.047)</td>
<td>4.5 ± 1.96 (0.001)</td>
</tr>
<tr>
<td>3.</td>
<td>Neonatal gestational age (weeks)</td>
<td>38.4 ± 0.96 (0.001)</td>
<td>37.2 ± 1.96 (0.006)</td>
<td>36.4 ± 1.10 (0.88)</td>
</tr>
<tr>
<td>4.</td>
<td>Neonatal apgar score (5 min)</td>
<td>9.2 ± 0.5 (0.001)</td>
<td>8.9 ± 0.99 (0.125)</td>
<td>7.8 ± 1.1 (0.001)</td>
</tr>
<tr>
<td>5.</td>
<td>Neonatal birth weight (Kg)</td>
<td>3.2 ± 0.29 (0.001)</td>
<td>2.9 ± 0.51 (0.019)</td>
<td>2.8 ± 0.36 (0.258)</td>
</tr>
</tbody>
</table>
Table 2. Comparison of maternal health indicators with neonatal parameters among lower class.

<table>
<thead>
<tr>
<th>Maternal Parameters</th>
<th>Mean ± SD</th>
<th>Fetal parameters</th>
<th>Mean ± SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal hemoglobin (g/dl)</td>
<td>9.64 ± 1.18</td>
<td>Fetal gestational age in weeks</td>
<td>36.4 ± 1.10</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neonatal apgar score in 5 min</td>
<td>7.8 ± 1.10</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neonatal birth weight in kg</td>
<td>2.8 ± 0.36</td>
<td>0.001</td>
</tr>
<tr>
<td>Maternal gravidity</td>
<td>4.5 ± 1.96</td>
<td>Fetal gestational age in weeks</td>
<td>36.4 ± 1.10</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neonatal apgar score in 5 min</td>
<td>7.8 ± 1.10</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neonatal birth weight in kg</td>
<td>2.8 ± 0.36</td>
<td>0.371</td>
</tr>
</tbody>
</table>

Preterm pregnancies are associated with many obstetric and pediatric complications which increases the work load of the tertiary healthcare centers. It is one of the major causes of infant morbidity and mortality in the developing world. Maternal socioeconomic factors have a great impact on pregnancy outcomes and neonatal parameters. The results of this study revealed a close association between maternal socioeconomic conditions and neonatal parameters in Pakistan. Maternal hemoglobin is reported to be greatly influenced by mother’s socioeconomic status which determines the neonatal outcome. Maternal anemia in pregnancy is a known risk factor for low birth weight, prematurity and intrauterine death. Maternal hemoglobin is also decreased as a result of large family size, multiparity, early age marriages and less birth spacing. These issues lead to serious neonatal complications.

It is observed in this study that maternal gravidity has a great influence on the neonatal parameters. Significance has been found in all the three classes (Table 1). Multigravity is well known to have adverse effects on the fetus, such as intrauterine growth restriction (IUGR), prematurity, small for gestational age and intrauterine death as well as obstetrics risks of hypertension, placenta previa, uterine rupture and gestational diabetes. Results of this study indicate the importance of perinatal care in multiparous females in order to minimize the undue obstetric and fetal consequences. It is noticeable that in our region, multigravity is more in low socioeconomic class due to their social and religious believes.

Among neonatal parameters, the birth weight was found to be very significant between upper and lower class, less significant between upper and middle while non-significant between middle and lower classes. The socioeconomic class determines the nutritional status of the pregnant mother which is strongly correlated with neonatal birth weight.

This study proved that the class difference between upper and lower and between middle and lower has a significant impact on neonatal apgar score in 5 min whereas it is not significant among upper and middle classes. Similar findings are reported by Odd et al. On the contrary, another study stated that apgar score is influenced by maternal age, BMI and parity but it is not affected by the socioeconomic status of the mother. It may be due to the fact that research population in the study was from a developed country. As Pakistan is a developing country, the relationship of socioeconomic status cannot be neglected in this region where lower socioeconomic class has less health facilities. This population also does not have an easy access to doctors and trained birth attendants, therefore, the obstetric complications are more common in such cases that end up in emergency caesarean section.
commonly associated with fetal distress at birth and in postnatal period\(^2\)\(^1\). Home delivery is also a social norm in Pakistan which at times complicates the delivery leading to obstructed labor, usually associated with very low Apgar score\(^2\)\(^2\).

This study has highlighted the impact of socioeconomic status on fetal gestational age in comparison between upper and middle as well as upper and lower class, however, it is found to be significant between middle and lower class. The difference of socioeconomic class reflects on the gestational age of the neonate\(^2\)\(^3\). As in lower class, lack of health facility, emotional and physical stress on the pregnant mother, inadequate nutrition, and no concept of family planning in some religious groups further intensify the problems during pregnancy and in postnatal period.

4. CONCLUSION
Through the data analysis of this study, it is concluded that maternal hemoglobin levels and maternal gravidity are markedly influenced by socioeconomic status of the pregnant mother. In turn this leads to drastic changes in neonatal parameters such as fetal gestational age, neonatal Apgar score and neonatal birth weight.

REFERENCES
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