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ORIGINAL ARTICLE

Frequency of Factors Responsible to Small for Gestational Age Babies in Primigravida

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ABSTRACT

Objective: To determine the frequency of factors responsible to small for gestational age infants in primigravid women.

Study Design: Cross Sectional Study

Setting: This study was carried out in the department of obstetrics and gynaecology of Agha Khan University Hospital, Karachi

Duration of Study: This study was conducted from 15th September 2018 to 10th January 2019.

Subjects and methods: A total of 127 women with singleton pregnancy and gestational age 28-35 weeks by LMP with 0 Parity were included. Women with history of miscarriage, diabetes and family history of SGA babies were excluded. Ultrasound was done to all women and Small for Gestational age babies (as per operational definition) was recorded. All the women was interviewed regarding smoking and detailed history and examination was done to make clinical assessment and for ordering the proper investigations to establish medical disorder by the researcher herself. Venous blood was collected from all women and was immediately sent to laboratory. Hemoglobin < 10 g/dL was recorded as anemia. Ultrasound examination was done for oligohydroamnios as per operational definition. Patients BMI were calculated. Hypertension was also calculated as per operational definition. Data was recorded for factors.

Results: Age range in this study was from 18-40 years with mean age of 27.968± 2.05 years and mean gestational age 31.692±2.40 weeks, mean weight 71.645±12.94 Kg, mean height 1.549±0.10 meters and mean BMI was 29.924±5.12 Kg/m2. Majority of patients were from 18-30 years age group (89.8%). As far as risk factors are concerned smoking was seen in 5.5%, overweight 65.4%, hypertension 13.4%, oligohydramnios 29.1%, anemia 12.6%, preeclampsia 15.7%, hypothyroidism 16.5%, hyperthyroidism 6.3%, antiphospholipid antibody syndrome 13.4% and diabetes mellitus was 8.7%.

Conclusion: A variety of risk factors have been discovered for newborns deemed SGA by customized centiles. SGA is associated with a number of lifestyle factors, many of which are controllable, such as food, smoking, and exercise. Future research is needed to verify our findings.

Keywords: Small for Gestational Age, Primigravid women, Factors

INTRODUCTION

According to the World Health Organization, more than 20 million newborns worldwide are born underweight (LBW) or weighing less than 2500 g each year, with the vast majority happening in low- and middle-income nations. This condition is caused by either preterm birth (PTB) or intrauterine foetal growth restriction (IUGR) [3].

One of the most common ways to determine IUGR is to weigh a pregnant woman at or below the 10th percentile for her gender and gestational age. Preterm-appropriate for gestational age (AGA) accounts for 8.1% of the 135 million babies born in LMICs in 2010; term-SGA accounts for 21.9%; preterm-SGA accounts for 2.1% [4]. When an infant is both preterm and SGA, they are at the greatest risk of both morbidity and mortality [5,6].

SGA births in low- and middle-income countries (LMICs) have a mortality risk of 2.44, 8.05, and 15.4 per cent, respectively, as compared to kids born term-AGA, according to a multi-country analysis [5].

The risk of malnutrition and long-term repercussions, such as poor neurodevelopment, non-communicable diseases, and psychological or emotional discomfort, is higher in preterm or SGA deliveries. Babies born to mothers who smoked cigarettes while pregnant, for example, may have lower birth weights than those whose mothers did not smoke, but the difference is not great enough to be classified as SGA [7-8].

The most common cause of IUGR in developed countries was chronic maternal vascular illness, including hypertension, diabetes mellitus, renal disease, and collagen vascular disease. IUGR may be caused by CMV, malaria, parvovirus, and rubella in the first or second trimester of pregnancy. Early gestation symmetric IUGR is caused by the majority of foetal causes.

Placental thrombosis or secondary consequences of maternal illness can also impede growth in hypercoagulable mothers, such as those with thrombophilia or antiphospholipid antibody syndrome. Foetal growth is inhibited by maternal hypoxia at high altitude, as well as other conditions that limit oxygen delivery to the foetus. [9] Preterm births (PTB) and small for gestational age (SGA) are associated with a wide range of long-term health

issues, including neurological, cardiovascular, and metabolic disorders.

Mc-Cowan L, et al. observed that smoking accounted for 19% of the risk and being overweight for 27% of the risk for small-for-gestational-age [11]. Hypertension, oligohydroamnios, anaemia, and Antiphospholipid antibody syndrome were also identified to be risk factors for Small-for-gestational-age in additional investigations [12-13]. There is an increased risk of SGA in diabetic women who have vascular illness (OR 6.0 (95 percent CI:1.5-23)). Uncontrolled hyperthyroidism increases the risk of low birth weight (OR: 9.2) (95 percent CI:5.47-15.6). Patients with hypothyroidism had a 15% chance of developing SGA [15].

MATERIALS AND METHODS

This cross-sectional study was carried out in the department of obstetrics and gynaecology of Agha Khan University Hospital, Karachi. Duration of study was 15th September 2018 to 10th January 2019.Total 127 women with singleton pregnancy having gestational age 28-35 weeks were included. Patients ages were ranging between 18-40 years. Patients with history of miscarriages, diabetic patients and patients with family history of SGA babies were excluded.

After getting approval from the hospital ethics' committee to conduct the study, data was collected from all patients presenting to the indoor department of hospital. Oral and written consent was obtained from the participants before the start of study. Before informed consent, the purpose and benefits of the study was explained and confidentiality was maintained. Ultrasound was done to all women and Small for Gestational age babies (as per operational definition) was recorded. All the women was interviewed regarding smoking and detailed history and examination was done to make clinical assessment and for ordering the proper investigations to establish medical disorder by the researcher herself. Venous blood was collected from all women and was immediately sent to laboratory. Hemoglobin < 10 g/dL was recorded as anemia. Ultrasound examination was done for oligohydroamnios as per operational definition. Patients BMI were calculated. Hypertension was also calculated as per operational definition.

Data was analyzed with statistical analysis program (IBM-SPSS.V.22). Frequency and percentage was computed for qualitative variables like age groups, economic status and factors leading to small for gestational age (Smoker, overweight, hypertension, Oligohydramnios, Anemia, preeclampsia, hypothyroidism, hyperthyroidism, Antiphospholipid antibody syndrome, and Diabetes mellitus). Mean ±SD was presented for quantitative variables like age, gestational age, weight, height and BMI.

RESULTS

Age range in this study was from 18-40 years with mean age of 27.968± 2.05 years and mean gestational age 31.692±2.40 weeks, mean weight 71.645±12.94 Kg, mean height 1.549±0.10 meters and mean BMI was 29.924±5.12 Kg/m2 as shown in Table-I.

As far as risk factors are concerned smoking was seen in 5.5%, overweight 65.4%, hypertension 13.4%, oligohydramnios 29.1%, anemia 12.6%, preeclampsia 15.7%, hypothyroidism 16.5%, hyperthyroidism 6.3%, antiphospholipid antibody syndrome 13.4% and diabetes mellitus was 8.7% as shown in Table 2.

Table 1: Mean± SD of age, gestational age, weight, height and BMI. n=127

Demographic variables	Mean ± SD
Age(years)	27.968± 2.05
Gestational age (weeks)	31.692±2.40
Weight (Kg)	71.645± 12.94
Height (meters)	1.549±0.10
BMI (Kg/m^2)	29.924±5.12

Majority of patients were from 18-30 years age group (89.8%) as shown in figure 1.

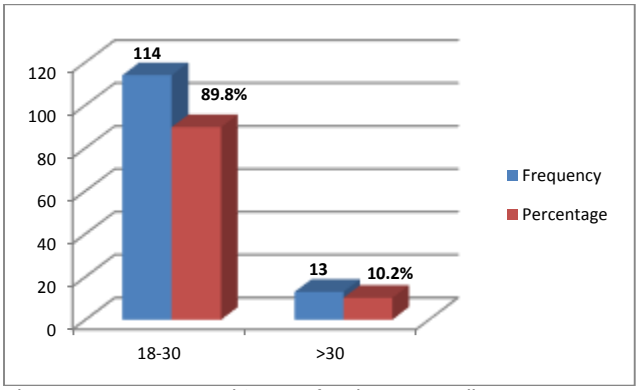

Figure 1: Frequency and %age of patients according to age group

Table 2: Risk Factors for SGA

Risk Factors	Frequency No.	%age
Smokers		
Yes	7	5.50%
No	120	94.50%
Overweight		
Yes	83	65.40%
No	44	34.60%
HTN		
Yes	17	13.40%
No	110	86.60%
Oligohydramnios		
Yes	37	29.10%
No	90	70.90%
Anemia		
Yes	16	12.60%
No	111	87.40%
Pre-eclampsia		
Yes	20	15.70%
No	107	84.30%
Hypothyroidism		
Yes	21	16.50%
No	106	83.50%
Hyperthyroidism		
Yes	8	6.30%
No	119	93.70%
Antiphospholipid antibody syndrome		
Yes	17	13.40%
No	110	86.60%
Diabetes Mellitus		
Yes	11	8.70%
No	116	91.30%

DISCUSSION

Using bespoke birthweight centiles, this is the first study to identify risk variables for SGA newborns. Smoking and being a petite mother have consistently come out on top in research looking at characteristics that increase the likelihood of having an SGA baby based on population centiles in industrialised countries. For customized-SGA infants, smoking is a risk factor, although maternal height and weight are not, because these parameters were taken into account while calculating the custom centile. Both SGA and normotensive-SGA risk were impacted by the pre-conception diet of the mother. There was an almost 50% reduction in SGA in women who ate at least three servings of green leafy vegetables per day during the month before to pregnancy, while women who consumed fruit less than weekly had a two-fold increased chance. Green leafy vegetables and fruits have also been linked to a lower risk of small for gestational age (SGA), as determined by population centiles [16-18]. Fruit and vegetable micronutrients (such as ascorbate, carotenoids, folate, and magnesium), dietary fibre, and other phytochemicals may all have a role in protecting against cancer. On the other hand, it could be a proxy for a more healthful lifestyle or an indication of additional complicating factors. The opposite is true of Mitchell et al [17]. SCOPE participants' increased consumption of folic acid may account for this discrepancy (71.5 percent at 15 weeks of gestation).

My study found that smoking was 5.5%, obesity 65.4 percent, hypertension 13.4%, oligohydramnios 29.1%, anaemia 12.6%, preeclampsia 15.7 %, hypothyroidism 16.5 %, hyperthyroidism 6.3 %, antiphospholipid antibody syndrome 13.4 %, and diabetes mellitus 8.7% as risk factors for small for gestational age infants in first-time mothers. Mc-Cowan L, et al. observed that smoking accounted for 19% of the risk and being overweight for 27% of the risk for small-for-gestational-age [11].

Hypertension, oligohydroamnios, anaemia, and Antiphospholipidantibody syndrome are all risk factors for small-for-gestational-age, according to a research by Sebastian T. et al. [12,13]. SGA (OR: 6.0) is found in diabetic women with vascular disease (95 percent CI :1.5-23). Uncontrolled hyperthyroidism increases the risk of low birth weight (OR: 9.2 (95 percent CI: 5.47-15.6) [14]. Patients with hypothyroidism have a 15% chance of developing SGA [15].

Our findings, therefore, show that some meals may have advantages for embryonic growth, but that these advantages may not be apparent with nutritional supplementation. For public health reasons, possible risk factors for SGA that can be addressed through public health interventions in the fast-food culture are important. In both SGA and normotensive-SGA groups, smoking five cigarettes a day at 15 weeks of gestation was associated with a 30% to 40% increase in risk. Moreover, in line with prior research, we discovered that SGA was linked to raised uterine artery Doppler resistance index and lower mid-pregnancy foetal measures. Genetic variables may alter placental function, as evidenced by the link between previous cases of preeclampsia and a higher risk of SGA in the offspring [19-20]. SGA children delivered to hypertensive moms have been studied in just a few previous studies [21-23].

Small foetal measures at the 20-week scan were shown to be common to all SGA groups and were associated with an increased likelihood of SGA infants being born to mothers who had high blood pressure. For women with hypertension, a previous early pregnancy loss was linked to an approximately two-fold increased risk of having an SGA baby, especially if that loss occurred with the same partner as the present pregnancy. When comparing our findings to those published by Saftlas, [24] a previous early pregnancy loss to the same partner was found to be protective against pre-eclampsia, the differences in the comparison groups explain the discrepancy.

In contrast to Saftlas, who compared women with and without preeclampsia in his study [24], we looked at the risk of SGA in women with hypertensive problems.

In vitro fertilisation (IVF) pregnancies have been linked to higher incidences of pre-eclampsia and small for gestational age (SGA) babies [24-25]. On the contrary to the findings of Odegard et al [26], we found no significant influence of smoking on the risk of hypertensive-SGA in women with pre-eclampsia, even after multivariate analysis. There is a possibility that this is due to the fact that our study had a lower prevalence of smoking than theirs (7 percent instead of 20 percent). Prospective design, robust follow-up, and real-time data monitoring protocols all contributed to the high quality of our study's findings and findings, respectively. Additionally, the SCOPE project is one of the first large-scale prospective pregnancy cohorts to collect such extensive risk-factor data. All the known and speculated risk factors for SGA newborns are included in our database.

CONCLUSION

A variety of risk factors have been discovered for newborns deemed SGA by customised centiles. SGA is associated with a number of lifestyle factors, many of which are controllable, such as food, smoking, and exercise. Future research is needed to verify our findings.

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