Comparative study of birth weight in newborns in tribal and non-tribal area in Marathwada region of Maharashtra, India

Ramdas G. Narwade<sup>1,2</sup>, Uttam B. More<sup>2</sup>

<sup>1</sup>Assistant Professor, Dept. of Obstetrics and Gynecology, Indian Institute of Medical Science and Research Medical College, Jalna, Maharashtra, <sup>2</sup>Senior Obstetrician and Gynecologist, More Nursing Home, Nanded, Maharashtra, India

*Corresponding Author: Ramdas G. Narwade
Email: shrutinarwde4@gmail.com

Received: 20<sup>th</sup> August, 2018
Accepted: 18<sup>th</sup> September, 2018

Abstract

Introduction: Birth weight is an important health indicator. The health indicator helps us to know the trend of population structure and social setup of the tribal people. The present study was conducted to study the birth weight among two population categories - tribal population of Kinwat, District Nanded and non-tribal population of Badnapur, Jalna, Maharashtra.

Materials and Methods: The birth weight of 2000 neonates born from 1<sup>st</sup> April 2012 to 31<sup>st</sup> March 2014 were obtained from the registers of the maternity wards of two Hospitals; More Nursing Home, Kinwat District Nanded for tribal population and IIMSR Medical College & Noor Hospital, Badnapur, Jalna, Maharashtra, India.

Results: Mean birth weight among the tribal neonates (2.74 kg) was significantly lower (p-value=0.001) than among non-tribal neonates (2.88 kg). Also, the proportion of low birth weight neonates was significantly higher among the tribal population. Similarly, for maternal age (age group 20-25 years) and parity (Para 2-4), the mean birth weight is significantly lower in tribal population as compared to the non-tribal population.

Conclusion: The mean birth weight is lower in tribal population and also the proportion of low birth weight in neonates is high in this population. This signifies that the tribal population deserves attention and focused health interventions.

Keywords: Birth weight, Tribal population, Low birth weight, Maternal age, Parity.

Introduction

Maharashtra is considered as an important developed state in our country in terms of education, industrialization and social growth, but scheduled tribes in this state are found in backward conditions and they struggle for survival. Therefore, it is immensely necessary to study and understand population structure and social setup of the tribal people. According to 2011 census, the total population of Maharashtra is 11,23,74,333, out of it 1,05,10,213 reported as scheduled tribe. These tribal populations are more in rural, less educated and less occupationally skilled. Now, birth weight is an indicator of intrauterine growth which provides an index of individual variability and also some information on the nutrition and health status of the mother. Hence in the present study, an attempt has been made to study the birth weight among two population categories-tribal population of Kinwat, district Nanded and non-tribal population of Badnapur, Jalna, Maharashtra, India.

Materials and Methods

The birth weight of 2000 neonates were obtained from the registers of the maternity wards of two hospitals - More Nursing Home, Kinwat, district Nanded for tribal population and IIMSR Medical College & Noor Hospital, Badnapur, Jalna for non-tribal population, where complete birth records are maintained by the hospital authorities. The results reported here are based upon only singlet on live births obtained from individuals belonging to the lower and middle classes of socio-economic groups. Still-births, prematures, multiple births and births belonging to the higher socio-economic group have not been considered in the present data. The data comprised of 2000 infants born from 1<sup>st</sup> April 2012 to 31<sup>st</sup> March 2014. Other information also recorded includes the age of the mother, the order of birth and the sex of the baby. The statistical significance of differences in birth weight for maternal age and parity were tested using the unpaired t-test, z-test and chi-square test.

Table 1: Comparison of mean birth weight between two groups

|               | Non-tribal | Tribal | p-value    |
|---------------|------------|--------|------------|
| Mean          | 2.88       | 2.74   | 0.001 (highly significant) |
| S.D.          | 0.870      | 0.503  |            |
It was seen from Table 1 that the mean birth weight in singlet on tribal population was 2.74kg (S.D.=0.503) and that in non-tribal population was 2.88kg (S.D.=0.870). Thus, the p-value is 0.001 which is highly significant.

Table 2: Distribution of birth weight according to study area

| Birth weight (in kg) | Non-tribal (%) (n=1000) | Tribal (%) (n=1000) |Chi-square | p-value |
|----------------------|--------------------------|---------------------|-----------|---------|
| < 2                  | 12 (1.2%)                | 46 (4.6%)           | 36.46     | 0.000   (highly significant) |
| 2.0 - 2.5            | 270 (27.00%)             | 341 (34.1%)         |           |         |
| ≥ 2.5                | 718 (71.8%)              | 612 (61.2%)         |           |         |

It was observed from Table 2 that among study population, 71.8% of the non-tribal women had birth-weight ≥2.5 kg whereas 61.2% of the tribal women had birth weight ≥2.5 kg, which is highly significant (p=0.000). The overall low-birth weight (<2500g) rate for tribal population was 34.1% which was significantly higher as compared to non-tribal population (27.00%). Tribal women (4.6%) had higher proportion of births weighing less than 2kg than did the non-tribal women (1.2%) which is highly significant (p= 0.000).

Table 3: Socio-demographic characteristics of the study population

| Category       | Non-Tribal (n=1000) No. (%) | Tribal (n=1000) No. (%) |
|----------------|-------------------------------|-------------------------|
| Age            |                               |                         |
| < 20           | 48 (4.8)                      | 45 (4.5)                |
| 20 - 24        | 534 (53.4)                    | 607 (60.7)              |
| 25 - 29        | 355 (35.5)                    | 295 (29.5)              |
| 30 - 34        | 51 (5.1)                      | 48 (4.8)                |
| ≥ 35           | 12 (1.2)                      | 5 (0.5)                 |
| Religion       |                               |                         |
| Hindu          | 612 (61.2)                    | 702 (70.2)              |
| Muslim         | 217 (21.7)                    | 183 (18.3)              |
| Others         | 171 (17.1)                    | 115 (11.5)              |
| Parity         |                               |                         |
| Prim   | 237 (23.7)                    | 548 (54.8)              |
| Para 2-4       | 744 (74.4)                    | 440 (44.0)              |
| Para 5+        | 19 (1.9)                      | 12 (1.2)                |
| Gender of Baby |                               |                         |
| Male           | 547 (54.7)                    | 487 (48.7)              |
| Female         | 453 (45.3)                    | 513 (51.3)              |
| Location       |                               |                         |
| Urban          | 77 (7.7)                      | 592 (59.2)              |
| Rural          | 923 (92.3)                    | 408 (40.8)              |

It was seen from Table 3 that as to parity, 23.7% of non-tribal and 54.8% of the tribal mothers were primipara. On the other hand, 1.9% of the non-tribal mothers and 1.2% of tribal mothers were Para 5 or greater. As to maternal age, 4.8% of the non-tribal mothers and 4.5% of the tribal mothers were under age of 20 where as 1.2% of non-tribal and 0.5% of tribal women were over the age of 40. In non-tribal population, 54.7% were male baby and 45.3% were female baby. In tribal population, 48.7% were male baby and 51.3% were female baby. In our study population, 92.3% of the non-tribal population belonged to rural area, whereas 40.8% of the tribal population belonged to rural area and 59.2% of the tribal population to urban area.

Table 4: Distribution of birth weight according to age of mother

| Mother’s age | Non-tribal (%) Mean ± SD | Tribal (%) Mean ± SD | p-value |
|--------------|--------------------------|----------------------|---------|
| < 20         | 2.749 ± 0.42             | 2.581 ± 0.67         | 0.159 (not significant) |
| 20 - 24      | 2.88 ± 1.3               | 2.723 ± 0.48         | 0.003 (highly significant) |
| 25 - 29      | 2.89 ± 0.41              | 2.804 ± 0.48         | 0.016 (significant) |
| 30 - 34      | 2.91 ± 0.43              | 2.77 ± 0.57          | 0.169 (not significant) |
| ≥ 35         | 3.017 ± 0.48             | 3.04 ± 0.66          | 0.946 (not significant) |
It was observed from Table 4 that the distribution of birth weight according to age of mother, in both tribal and non-tribal women there was no significant difference in birth-weight in both the groups for maternal age <20 years and in the group with maternal age > 30 years. Similarly, in primipara and multipara (Para 5+), there was no significant difference in birth weight of tribal and non-tribal women. Thus, maternal age and parity (extremes of age and parity) are independent predictors of birth weight.

Table 5: Distribution of birth weight according to parity

| Birth weight (in kg) | Non-tribal (%) Mean ± SD | Tribal (%) Mean ± SD | p-value |
|----------------------|--------------------------|---------------------|--------|
| Primi                | 2.71 ± 0.37              | 2.69 ± 0.51         | 0.467 (not significant) |
| Para 2-4            | 2.93 ± 0.98              | 2.81 ± 0.48         | 0.006 (highly significant) |
| Para 5+             | 3.12 ± 0.49              | 2.93 ± 0.41         | 0.226 (not significant) |

As shown in Table 5 that in the age group, 20-24 years, the mean birth weight in non-tribal population was 2.88 kg (S.D.=1.13) and that in tribal population was 2.723 kg (S.D.=0.48) which is highly significant (p=0.03). Similarly in the age group of 25-29 years, the mean birth weight in non-tribal population is 2.89 kg (S.D.=0.41) as compared to the tribal population which is 2.804 kg (S.D.=0.48) which is again significant (p=0.16). As for parity, the group of women belonging to Para 2-4, the mean birth weight for non-tribal women was 2.93 kg (S.D. ±0.98) and that for tribal women was 2.81 kg (S.D.±0.48) which is again highly significant (p=0.06). Thus, from maternal age and parity, it is clear that birth weight depends upon the maternal nutrition, health education and socioeconomic status.

Discussion
The present study showed that the mean birth weight is more in the non-tribal population as compared to the tribal population. Also, the frequency of low birth weight (LBW) and very low birth weight baby is determined in large part by maternal factors which physiologically limit the size of the infant. Walton Arthur also shown that the size of the infant was determined by the size of the mother. Thus, the results of present study are in conformity with the earlier studies. Contrary to the results of our present study, study conducted by Sarkar NC et al.10 on the Changlang tribes of Arunachal Pradesh showed that tribal babies are heavier than other babies of North East India.

Conclusion
According to Millenium development goals, a move should be made to improve access to services for remotely placed populations including people of tribal origin. Birth weight is an important health indicator. In the present study, we tried to map the trend in this health indicator which is of utmost importance in determining focused health interventions and in identifying subpopulations that may be lagging behind. The health of remote, marginalized populations deserves attention and focus and is an area likely to show great improvement with targeted intervention and health goals.
References
1. Morton S. Adams, Jerry D. Niswander. Birth weight of North American Indians. Human Biology. 1968;226-34.
2. Ashitkar SV, Kukarni MB, Sadavarte VS, Ashitkar RS. Analysis of Birth weight of rural hospital. Indian J Community Med. 2010;35(2):252-55.
3. Baekgaard ES, Hulse CL. Trends in birthweight among four tribal communities in rural Tamil Nadu, India. Rural and Remote Health. 2014;14:27-28.
4. Helsel Deborah, Diana B. Petitti, and Peter Kunstadter. Pregnancy among the Hmong: birthweight, age, and parity. American J Public Health. 1992;82(10):1361-64.
5. National Family Health Survey NFHS-1, IIPS Maternal and Child Health. 1992-93;227-67.
6. National Family Health Survey NFHS-2, IIPS State finding 1998-99;1-4.
7. National Family Health Survey NFHS-3, IIPS Child Health 2005-6;225-26.
8. Ounsted, Margaret, and Christopher Ounsted. Maternal regulation of intra-uterine growth. Nature. 1966;21(2):995-97.
9. Walton Arthur. The maternal effects on growth and conformation in Shire horse-Shetland pony crosses. Proc R Soc Lond B. 1938;125(840) The Royal Society, 1938.
10. Sarkar NC, Saikia AC. Birth weight at Changlang, Arunachal Pradesh. The Indian Journal of Pediatrics. 2000;67(6):419-21.

How to cite this article: Narwade R. G, More U. B. Comparative study of birth weight in newborns in tribal and non-tribal area in Marathwada region of Maharashtra, India. Indian J Obstet Gynecol Res. 2018;5(4):496-499.