

Comparison of New Ballards Score and Parkins Score for Gestational Age Estimation- Original Article

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Abstract: *Study design:* It is a prospective analytical study. *Aim:* The Aim study of the Study is to compare the accuracy of New Ballards score (NBS) and Parkins score (PS) to assess the gestational age (GA) in newborns. *Method:* The GA of 284 babies was assessed by the PS and NBS. Assessment was done within 24 hours of birth. The two methods were compared using the Bland Altman Plot. The two methods of gestational age assessment were found to be in acceptable agreement. Parkins score helps us to easily assess the gestational age of babies within ± 12 days, mostly in sick and preterm babies.

Keywords: New Ballards score, Gestational age, Parkins score.

1. Introduction

It is essential to know the correct gestational age of Newborn, so as to evaluate the risk of morbidity and mortality. The New Ballards Scores (NBS) is primarily used to assess the gestational age in all newborn. Dr. Jeanne L. Ballard gave the new ballard score. The new ballard score includes physical criteria assessing physical maturity and neuromuscular criteria assessing neuromuscular maturity. The physical maturity is assessed by skin, planter surface, lanugo, breast eye, ear, genitals male, genitals female. The neuromuscular maturity includes Posture, Arm recoil, Square window test, Popliteal angle, Heel to ear, Scarf sign. In sick infants or those in incubators, many of the neurologic criteria are difficult to assess. The four Criteria Used in Parkins score are skin texture, skin colour, ear firmness and breast size. The parkins score uses only four criteria and is thus Easier for practical use.

2. Aim and Objective

The aim of Study is to determine the accuracy of physical criteria in assessment of gestational age of babies. So as to avoid the errors which were caused by Ballard Score Due to impaired neurological status

3. Material and Method

- **Study Design-** It is a prospective analytical type of clinical study.
- **Study Population-** 350 babies.
- **Place of Study** –Tertiary care hospital.
- **Period of Study-** 6 months, from March to September 2015
- **Inclusion Criteria-** Babies whose GA estimate was available by last menstrual period (LMP) and/or first trimester ultrasonography scan were included.

- **Exclusion Criteria-** Babies whose obstetric estimate differed from NBS by more than 2 weeks were excluded.

4. Methodology

Written informed consent was taken from the parent., For the study 350 babies needed to be assessed. It was assuming that there is a correlation of 0.75 between the NBS and the PS^[1]. The assessments were done by two different investigators: one was for the NBS and the other was for the PS. The assessment was done. Mostly within 24 hours of life. The investigators were blinded to the GA estimate of the mother. One independent assessor did the NBS and confirmed that NBS and Obstetric score match. These subjects were included in the study and were assessed by the PS by the other investigator. The study protocol was approved by the Institutional ethics committee of the Tertiary care Hospital. Data were entered and analyzed in SPSS version 11.5. The two different methods were compared using the Bland Altman Plot ^[2]. The mean difference between the two methods was calculated and the standard deviation of the mean was found. The limits of agreement was calculated using the formula: mean \pm 1.96SD. The average of the two scores was plotted against the difference between the two readings for each sample.

5. Result

The number of subjects enrolled in the study was 284 . It gives the study a power of 80%. . All neonates were examined mostly within 1 to 29 hours of life (mean was 14.7 hours). The mean gestational age by dates/USG was 36.2 weeks, by NBS was 36.1 (SD-3.31) and by PS was 37.6 (SD- 4.06). The mean difference between Obstetric GA and NBS was 0.04 weeks.

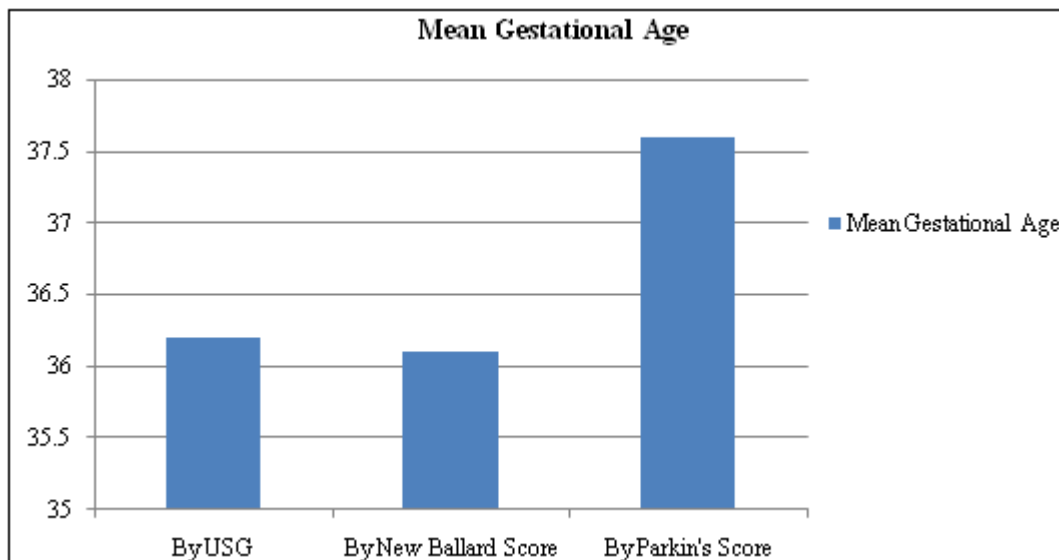


Figure 1: Bar Diagram showing comparison of accuracy of New ballard score and Parkins score to mean gestational age

Table 1: Showing characteristic of subjects

Characteristics	No. (%)
Birth weight (g)	2264
Males	145 (51)
Females	138 (4)
GA by dates/USG (wks)	36.2
Large for gestational age	4 (1.4)
Appropriate for gestational age	195 (68.6)
Small for gestational age	85 (30)
Normal birth weight	130 (45.7)
Low birth weight	102 (35.9)
Very low birth weight	40 (14)
Extremely low birth weight	16 (5.6)
Forceps extraction	4 (0.6)
Spontaneous vaginal	147 (51.6)
Macrosomia	1 (0.35)
Cesarean section	137(48.5)
1 min APGAR score <7	60 (21.1)
5 min APGAR score <7.5	(1.7)
Sick newborns	96 (33.8)
Normal newborns	189 (66.1)
Intramural	270 (95)

accurate estimate of gestational age. In our study, when assessed by new ballard score there are 16 babies with GA less than 30 weeks. when asses by parkins score there are only 9 babies less than 30 weeks. This limitation was also observed by Parkin, et al. [1]. Two is the lowest score in parkins score. Since two is the lowest score in the PS, which corresponds to a GA of 30 weeks, the confidence with which GA can be assessed in a baby who scores two or less is uncertain. 95% confidence limits for prediction of GA from the sum of the scores for the 4 most reliable characteristics in the study done by Parkin, et al. [1] was ± 12 days, which is similar to the mean difference obtained in the present study.

7. Conclusion

The results were obtained by the Bland Altman plot which showed that there is a similarity between the NBS and PS. Most of the values were within the limits of agreement. New ballard score is more accurate than parkins score. But in sick preterm babies new ballard score is quit cumbersome so parkins score is an better option.

6. Discussion

There is a need for a method of estimating gestational age of babies which should not upset ill babies. This in order to distinguish between preterm babies and small for dates babies it should not be affected by the quality of intrauterine growth [3]. Parkins, assessed the accuracy of various physical characteristics in comparison to the neurological criteria which were used in the Dubowitz score. They recommended a score consisting of four physical characteristics to assess the gestational age of babies. In 1979, Ballards, et al. [4] modified the Dubowitz score. It was with the aim to develop a simplified score for assessment of fetal maturation of newly born infants. In this study, we compared the accuracy of the PS with the NBS. This is to assess the gestational age in normal and sick babies. GA assessment was performed at mean time of 14 hours 7 minutes, which thus avoids factors that decrease the accuracy of physical criteria [5]. In this study, GA a assessment by NBS was found to be more accurate than PS. As depicted by the bar diagram above. To examine preterms less than 28 weeks, NBS gives a more

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