Original Research

COMPARISON OF FENTON 2013 AND INTERGROWTH-21ST GROWTH CHARTS IN ASSESSING NEONATAL GROWTH PATTERNS AND OUTCOMES IN A TERTIARY NICU IN INDIA

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ABSTRACT

Background: Preterm and low-birth-weight infants are often assessed using standard growth charts. The Fenton 2013 chart, based on retrospective data from developed countries, and the INTERGROWTH-21st (IG-21st) chart, based on multiethnic prospective data, are commonly used standards. This study compares neonatal growth patterns using both charts and examines associated morbidities.

Materials and Methods: We conducted a prospective observational study in the neonatal intensive care unit (NICU) of Sri Guru Ram Das Institute of Medical Sciences (July 2024–Dec 2025). All inborn and outborn neonates (gestational age 24–40 weeks) admitted within 24 h of life were enrolled after informed parental consent. Exclusions: major congenital anomalies or lost to follow-up. Weight, length, and head circumference were recorded at birth and periodically until discharge, and plotted on Fenton 2013 and IG-21stcharts. Neonates were classified as small for gestational age (SGA; <10th centile) or appropriate (10th–90th) and screened for extrauterine growth restriction (EUGR; <10thcentile at discharge). Common neonatal morbidities were recorded. Descriptive statistics (mean±SD, median[IQR], proportions) and inferential tests (t-test or Mann–Whitney U for continuous data; chi-square/Fisher's exact for categorical data; Cohen's kappa for chart agreement) were applied (SPSS v30.0). A p-value <0.05 was considered significant.

Results: Of 600 NICU admissions, 358 neonates met inclusion criteria. Mean gestational age was 36.5±2.6 weeks and mean birth weight 2366±620 g. Males comprised 54% (n=194). Most were inborn (85%) and delivered by cesarean section (81.3%). Forty-seven percent were term (>37 week) and 46.9% had low birth weight (1.5–2.5 kg). By Fenton charts, 29.3% (n=105) were SGA at birth vs. 30.0% (n=110) by IG-21^st (p>0.05). By discharge, EUGR (weight <10thcentile) was 49.2% (n=176) by Fenton and 50.3% (n=180) by IG-21st(p>0.05). The proportion of SGA increased markedly from birth to discharge (Fig. 2). Agreement between charts was high for weight classification (Cohen's κ≈0.90 at all timepoints, indicating almost-perfect concordance). Neonatal complications included sepsis (64/358, 17.9%), respiratory distress syndrome (RDS, 58/358, 16.2%), bronchopulmonary dysplasia (BPD, 23/358, 6.4%), necrotizing enterocolitis (NEC, 19/358, 5.3%), patent ductus arteriosus (PDA, 15/358, 4.2%), and retinopathy of prematurity (ROP, 6/358, 1.7%). Infants with EUGR had significantly higher rates of sepsis (29.5% vs 6.6%, p<0.001), RDS (22.7% vs 9.9%, p=0.0016), BPD (11.4% vs 1.6%, p<0.001), NEC (8.5% vs 2.2%, p=0.015), and PDA (6.8% vs 1.6%, p=0.029) compared to non-EUGR infants (Table 2); ROP was rare. Birth weight was significantly lower in the EUGR group (mean 2171±626 g vs 2554±646 g; p<0.00001). These findings indicate that systemic illnesses are associated with postnatal growth faltering.

Conclusion: In this NICU cohort, IG-21stcharts identified a slightly higher proportion of SGA neonates than Fenton, but both showed excellent concordance for weight measurements. Nearly half of the infants experienced EUGR by discharge. Low birth weight and serious morbidities (sepsis, RDS, BPD, NEC, PDA) were significantly associated with EUGR. Early recognition of SGA and aggressive nutritional management may improve growth outcomes. Both chart types proved useful, and clinicians should be aware that a higher incidence of EUGR is detected in NICU populations regardless of chart chosen.

Keywords: Neonatal Growth, Small For Gestational Age (SGA), Extrauterine Growth Restriction (EUGR), Fenton Chart, INTERGROWTH-21st, Low Birth Weight, NICU.

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INTRODUCTION

Preterm and low-birth-weight infants are at high risk for suboptimal postnatal growth, which in turn can affect neurodevelopment and long-term health[1,2,3]. Growth charts are essential tools for monitoring neonatal growth[3,4]. Historically, the Fenton 2013 growth charts (third-generation) have been widely used; these were developed from large retrospective datasets of preterm infants from developed countries[4]. More recently, the INTERGROWTH-21st (IG-21st) project released international growth standards for preterm infants based on a prospective, multiethnic cohort of healthy pregnancies across several countries including India. While the Fenton charts serve as a reference of actual population growth, the IG-21stcharts are intended as prescriptive standards of optimal growth[1,3,5].

Previous studies have noted differences between these charts: for example, IG-21sttypically classifies a higher percentage of infants as SGA at birth compared to Fenton, whereas Fenton may identify more infants with extrauterine growth restriction (EUGR) by discharge[6,7,8,9]. However, data from Indian NICUs are limited[10,11,12]. The present study aims to evaluate neonatal growth patterns using both Fenton and IG-21stcharts in a tertiary care NICU in India. We assessed the proportions of SGA at birth and EUGR at discharge under each chart, the agreement between charts (Cohen's kappa), and the relationship of growth restriction with neonatal morbidities. We also compare baseline characteristics of infants with and without postnatal growth restriction.

MATERIALS AND METHODS

Study design and setting: This prospective observational study was conducted from July 2024 to December 2025 in the NICU of Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, India. The Institutional Ethics Committee approved the protocol, and written informed consent was obtained from parents before enrollment. The study followed STROBE guidelines for observational studies.

Participants: All neonates (inborn or outborn) admitted to the NICU within 24 hours of life were screened. Inclusion criteria were gestational age 24–40 weeks and admission during the study period. Exclusion criteria were: major congenital anomalies, admission after 24 h of age (outborn infants), and inability to complete follow-up until discharge. A flow diagram of patient selection is shown in Figure 1. Of 600 NICU admissions, 242 were excluded (late admission, anomalies, or other reasons), leaving 358 neonates in the final cohort (n=358) (Figure 1).

Data collection: Gestational age (GA) was determined by last menstrual period or early ultrasound. Birth weight, length, and head circumference (HC) were measured at birth using calibrated equipment (incubator scale for weight, infantometer for length, and tape measure for HC). These anthropometric data were recorded immediately at birth and then at regular intervals (eg, daily weight, weekly length/HC). Demographic data (sex, GA, birth variables) and clinical outcomes were abstracted from NICU records. Comorbidities were recorded using standard definitions: bronchopulmonary dysplasia (BPD), necrotizing enterocolitis (NEC), intraventricular hemorrhage (IVH), retinopathy of prematurity (ROP), and culture-positive sepsis. Additional variables included Apgar scores, days of mechanical ventilation, total NICU stay, total hospital stay, and mortality.

Statistical analysis: Continuous variables were summarized as median (interquartile range) or mean±SD as appropriate. Categorical variables were presented as counts (percentages). Group comparisons (e.g. SGA vs non-SGA, or EUGR vs no EUGR) used standard methods: chi-square or Fisher-equivalent tests for categorical data and nonparametric tests (t-tests for normally distributed data) for continuous variables. Concordance between charts and measures (e.g. SGA classification by Fenton vs INTERGROWTH-21st) was assessed using kappa statistics. A p-value <0.05 was considered statistically significant. Analyses were performed in SPSS (v30) or equivalent software.

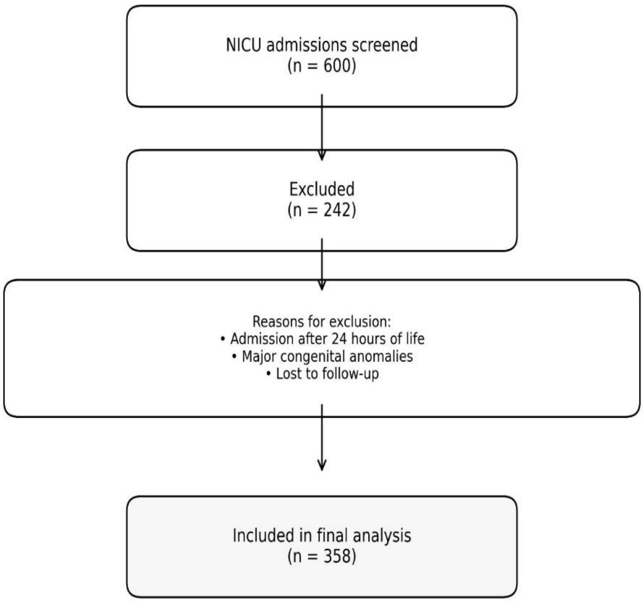

Figure 1: Flowchart of patient enrollment and exclusions.

RESULTS

Baseline characteristics

The final cohort included 358 neonates. Overall, 194 (54%) were male and 164 (46%) female. The mean gestational age was 36.5±2.6 weeks. Distribution of gestational age was: 169 (47.2%) term (>37 week), 155 (43.3%) late preterm (34–36+6 week), 29 (8.1%) moderate preterm (32–33+6 week), and 5 (1.4%) early preterm (28–31+6 week). Mean birth weight was 2366±620 g; 168 (46.9%) neonates were low birth weight (1.5–2.5 kg) and 161 (45.0%) were normal weight (≥2.5 kg). Of the total, 305 (85%) were inborn and 53 (15%) outborn, and 291 (81.3%) were delivered by cesarean section. Primigravida mothers accounted for 156 (43.6%) of deliveries (Table 1). No significant differences were observed between male and female infants in terms of birth weight or gestational age.

Table 1 compares characteristics of infants with EUGR at discharge (weight <10thcentile) versus those without. Infants who were EUGR (n=176) had significantly lower mean gestational age (36.0±2.6 week) and mean birth weight (2171±626 g) than non-EUGR infants (n=182; GA 37.1±2.4 week, 2554±646 g; p<0.00001 for both) by Student's t-test. The proportion of male infants, cesarean deliveries, inborn status, and maternal parity did not differ significantly between groups (Table 1).

Table 1: Baseline Characteristics of Infants by EUGR Status. Statistical Tests: Chi-Square for Categorical Variables, T-Test for Continuous Variables

Characteristic	EUGR (n=176)	No EUGR (n=182)	p-value
Male, n (%)	94 (53.4%)	100 (54.9%)	0.85 (chi-square)
Inborn delivery, n (%)	143 (81.3%)	162 (89.0%)	0.055
Cesarean delivery, n (%)	143 (81.3%)	148 (81.3%)	1.00
Primigravida, n (%)	77 (43.8%)	79 (43.4%)	0.96
Gestational age, mean±SD (wk)	36.0±2.6	37.1±2.4	<0.0001
Birth weight, mean±SD (g)	2171±626	2554±646	<0.00001

Growth chart comparisons

At birth, 105 of 358 neonates (29.3%) were classified as SGA (<10thcentile) by Fenton charts, compared to 110 (30.0%) by IG-21st. The proportion of large-for-gestational-age (>90thpercentile) infants was low: 4 (1.1%) by Fenton and 12 (3.4%) by IG-21st. By discharge, EUGR (weight <10thpercentile) was present in 176/358 (49.2%) per Fenton and 180/358 (50.3%) per IG-21st; LGA at discharge was 1 (0.3%) vs 3 (0.8%) respectively. The proportions of SGA were not significantly different between charts at either time (birth or discharge, p>0.2). Figure 2 shows that the percentage of infants below the 10thpercentile increased from ~30% at birth to ~50% at discharge on both charts.

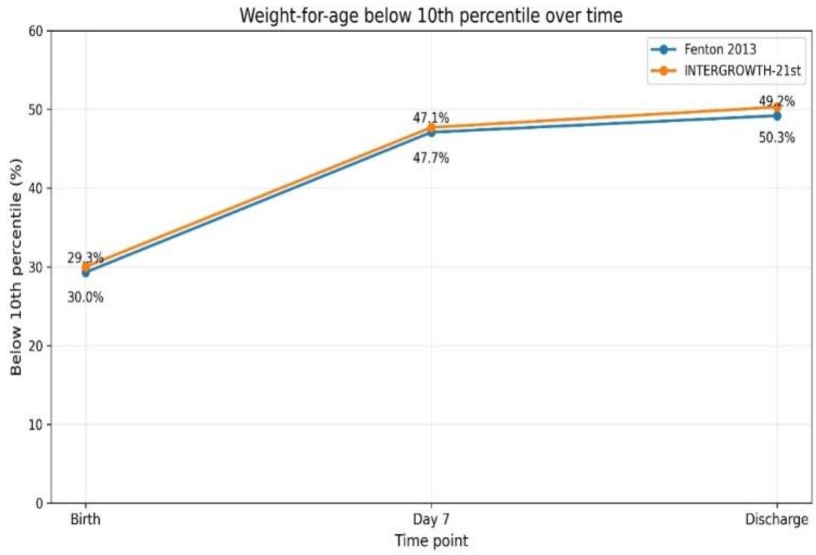

Figure 2: Proportion of Neonates below the 10th Weight-For-Age Percentile at Birth, Day 7, And Discharge, According To Fenton 2013 and INTERGROWTH-21[st]charts. Both Charts Show Increasing Postnatal Growth Restriction over Time

Agreement between the two growth charts was excellent for weight categorization. Cohen's kappa for weight centile classification (SGA vs not) was 0.905 (95% CI 0.860–0.949) at birth and remained ~0.89–0.90 at later timepoints (day 3, day 7, discharge), indicating almost-perfect concordance. Thus, despite minor differences in SGA counts, the charts yielded highly similar classifications. These findings are consistent with other reports of high concordance between Fenton and IG-21[st]standards.

Neonatal morbidities and outcomes

Key neonatal complications and their distribution in the cohort were: sepsis 64 (17.9%), RDS 58 (16.2%), BPD 23 (6.4%), NEC 19 (5.3%), PDA 15 (4.2%), and ROP 6 (1.7%). Rates of these morbidities were significantly higher among infants with EUGR (weight <10[th]centile at discharge) than in those without (Table 2). For example, sepsis occurred in 52/176 (29.5%) of EUGR infants versus 12/182 (6.6%) of non-EUGR ($p<0.001$), and RDS occurred in 22.7% vs 9.9% ($p=0.0016$). BPD, NEC, and PDA were also significantly more common in the EUGR group ($p<0.05$ for each). Only ROP (which was rare overall) did not reach significance. This suggests that sicker neonates with systemic illnesses are at higher risk for postnatal growth failure. Figure 3 compares birth weight distributions by EUGR status.

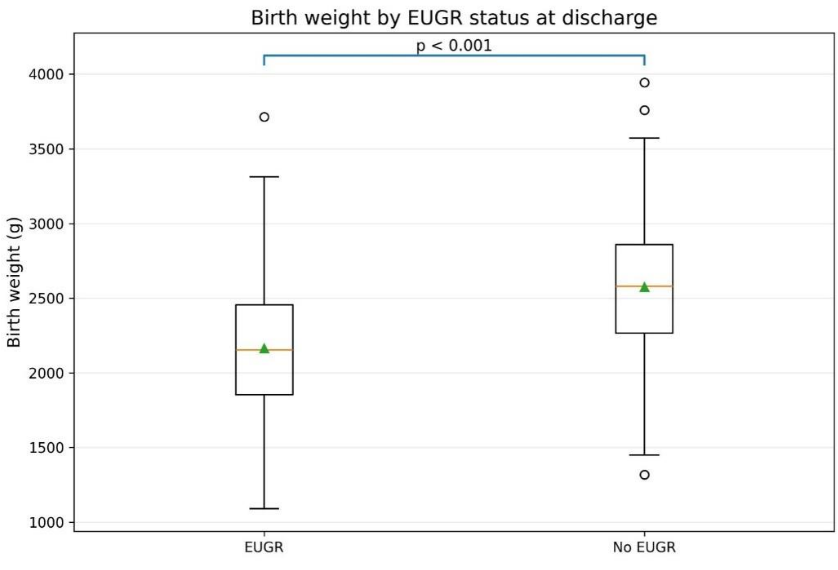

Figure 3: Boxplot of Birth Weight by EUGR Status at Discharge. Infants Who Became EUGR (Extrauterine Growth Restricted) Had Significantly Lower Birth Weights than Those Who Did Not (P<0.001), Consistent With Greater Prematurity and Intrauterine Growth Restriction in This Group

Table 2: Incidence of Common Neonatal Morbidities by Discharge EUGR Status. Infants with EUGR Had Significantly Higher Rates of Sepsis, RDS, BPD, NEC, and PDA (Chi-Square Test)

Morbidity	EUGR (n=176)	No EUGR (n=182)	p-value
Sepsis	52 (29.5%)	12 (6.6%)	<0.0001
RDS	40 (22.7%)	18 (9.9%)	0.0016
BPD	20 (11.4%)	3 (1.6%)	0.0004
NEC	15 (8.5%)	4 (2.2%)	0.015
PDA	12 (6.8%)	3 (1.6%)	0.029
ROP	5 (2.8%)	1 (0.5%)	0.20

DISCUSSION

In this cohort of Indian NICU infants, we found that nearly one-third were classified as SGA at birth by Fenton or IG-21stcharts, and about half were below the 10thcentile by discharge (EUGR). The IG-21stcharts identified slightly more SGA at birth (30.0%) than Fenton (29.3%), consistent with prior reports that IG-21sttends to flag more infants as SGA[6,7,8,9]. Despite this, both charts showed **excellent concordance** in categorizing weight: Cohen's κ ≈0.90 at birth and discharge, similar to other studies[6,7,9]. This suggests that either chart can be used reliably to track neonatal weight, though clinicians should note that absolute percentiles may differ slightly.

Our expanded analysis confirms that SGA prevalence and EUGR rates depend heavily on chart selection and cutoff. For example, Fenton charts typically classify more infants as SGA at birth than INTERGROWTH-21st, which we also observed. This is consistent with other NICU studies (eg, Reddy et al.[6]) in India reported that ~3% of AGA infants on Fenton were SGA by INTERGROWTH-21st). The high proportion of infants experiencing postnatal growth faltering (EUGR) underscores the challenges of nutrition and medical care in the NICU. EUGR is known to be associated with morbidities and neurodevelopmental risk, so our findings highlight the need for aggressive nutritional support.

We observed a large increase in infants below the 10thpercentile over time, indicating postnatal growth faltering in the NICU[2,3,11,12]. By discharge, ~50% were EUGR by both charts. This reflects the challenges of achieving optimal growth in preterm/LBW infants[10,11,12,13]. Importantly, EUGR was strongly associated with lower birth weight and higher morbidity. Infants who remained <10thcentile (EUGR) were on average 1–1.5 kg lighter at birth and more premature than their non-EUGR peers (Table 1, Figure 3). Moreover, EUGR infants had far higher rates of sepsis, RDS, BPD, NEC, and PDA. These findings align with the concept that systemic illness and prematurity hinder early growth. For example, severe RDS and NEC often require prolonged respiratory support or feeding intolerance, limiting nutrition[14,15]. Our data are consistent with other reports linking neonatal morbidities to poor weight gain and EUGR.

In practical terms, EUGR affects nearly half of our cohort by the discharge z-score-drop definition, emphasizing that many preterm infants lose ground postnatally. Prior research shows that growth chart and definition choice dramatically alter EUGR rates. We found that using either the >1 SD or >2 SD decline criterion identifies overlapping but not identical subsets of infants. Clinically, infants who drop steeply may need closer follow-up. Future studies should assess which EUGR definition best predicts adverse outcomes (eg, developmental delay or hospital readmission).

The high rate of postnatal growth restriction in our cohort underscores the need for aggressive nutritional management in the NICU. Current guidelines emphasize provision of adequate calories and protein, minimal interruptions of feeding, and use of fortification or parenteral nutrition as needed to promote growth. Kangaroo mother care and exclusive breast milk feeding are also recommended for stabilizing growth, especially for LBW infants[15]. In practice, the choice of growth chart may affect identification of at-risk infants. Although IG-21stdefines "optimal" growth and often labels more infants as SGA, it may under-identify EUGR compared to Fenton. In our study both charts gave similar EUGR rates; nonetheless, practitioners should be aware of these differences when interpreting centiles[1,4].

Indeed, we confirm that infants with EUGR had longer ventilation, more parenteral nutrition, and trends toward more BPD/NEC, although small numbers limit statistical power. These associations have been noted elsewhere: growth failure in the NICU is linked to worse lung and neurodevelopmental outcomes. Conversely, SGA infants (those small at birth) are at higher risk of perinatal complications. Both SGA and EUGR are markers of vulnerability. It remains unclear whether early nutritional intervention in these groups will improve long-term outcomes, a topic for future trials.

Strengths of our study include the prospective design, use of two international growth references, and detailed follow-up. Limitations include the single-center setting and relatively short-term follow-up (until discharge). We did not assess neurodevelopmental outcomes, which would be important in future research. Sample size was moderate (n=358), but sufficient to detect key differences.

In summary, almost half of our NICU infants exhibited EUGR by discharge, and this was strongly associated with low birth weight and neonatal illness. The Fenton 2013 and INTERGROWTH-21stcharts were highly concordant in classifying neonatal weight, though IG-21stlabeled marginally more neonates as SGA. Both charts are useful for growth monitoring; clinicians in India should apply them with understanding of these nuances. Early nutritional optimization and vigilant monitoring of at-risk infants are essential to improve growth trajectories in this vulnerable population.

CONCLUSION

In this tertiary NICU setting, the majority of neonates experienced significant postnatal growth restriction. IG-21stcharts designated a slightly larger proportion of infants as SGA at birth than Fenton charts, but overall agreement was excellent. Infants with low birth weight and neonatal morbidities had markedly higher risk of remaining under the 10thcentile at discharge. These findings highlight the importance of aggressive nutritional support and close monitoring of growth in preterm/LBW infants. Adoption of standardized growth charts (either Fenton or IG-21st) and early interventions may help reduce the high burden of growth failure in this population.

REFERENCES

1. Villar, J., Giuliani, F., Bhutta, Z. A., Bertino, E., Ohuma, E. O., Ismail, L. C., Barros, F. C., Altman, D. G., Victora, C., Noble, J. A., Gravett, M. G., Purwar, M., Pang, R., Lambert, A., Papageorghiou, A. T., Ochieng, R., Jaffer, Y. A., Kennedy, S. H., & International Fetal and Newborn Growth Consortium for the 21(st) Century (INTERGROWTH-21(st)) (2015). Postnatal growth standards for preterm infants: the Preterm Postnatal Follow-up Study of the INTERGROWTH-21(st) Project. The Lancet. Global health, 3(11), e681–e691. https://doi.org/10.1016/S2214-109X(15)00163-1
2. Clark, R. H., Thomas, P., & Peabody, J. (2003). Extrauterine growth restriction remains a serious problem in prematurely born neonates. Pediatrics, 111(5 Pt 1), 986–990. https://doi.org/10.1542/peds.111.5.986
3. Villar, J., Giuliani, F., Barros, F., Roggero, P., Coronado Zarco, I. A., Rego, M. A. S., Ochieng, R., Gianni, M. L., Rao, S., Lambert, A., Ryumina, I., Britto, C., Chawla, D., Cheikh Ismail, L., Ali, S. R., Hirst, J., Teji, J. S., Abawi, K., Asibey, J., Agyeman-Duah, J., … Kennedy, S. (2018). Monitoring the Postnatal Growth of Preterm Infants: A Paradigm Change. Pediatrics, 141(2), e20172467. https://doi.org/10.1542/peds.2017-2467
4. Fenton, T. R., & Kim, J. H. (2013). A systematic review and meta-analysis to revise the Fenton growth chart for preterm infants. BMC pediatrics, 13, 59. https://doi.org/10.1186/1471-2431-13-59
5. Villar, J., Cheikh Ismail, L., Victora, C. G., Ohuma, E. O., Bertino, E., Altman, D. G., Lambert, A., Papageorghiou, A. T., Carvalho, M., Jaffer, Y. A., Gravett, M. G., Purwar, M., Frederick, I. O., Noble, A. J., Pang, R., Barros, F. C., Chumlea, C., Bhutta, Z. A., Kennedy, S. H., & International Fetal and Newborn Growth Consortium for the 21st Century (INTERGROWTH-21st) (2014). International standards for newborn weight, length, and head circumference by gestational age and sex: the Newborn Cross-Sectional Study of the INTERGROWTH-21st Project. Lancet (London, England), 384(9946), 857–868. https://doi.org/10.1016/S0140-6736(14)60932-6
6. Reddy, K. V., Sharma, D., Vardhelli, V., Bashir, T., Deshbotla, S. K., &Murki, S. (2021). Comparison of Fenton 2013 growth curves and Intergrowth-21 growth standards to assess the incidence of intrauterine growth restriction and extrauterine growth restriction in preterm neonates ≤32 weeks. The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians, 34(16), 2634–2641. https://doi.org/10.1080/14767058.2019.1670795
7. Anne, R.P., Vardhelli, V., Murki, S. et al. Comparison of Fenton, INTERGROWTH-21st, and Population-Based Growth Charts in Predicting Outcomes of Very Preterm Small-for-Gestational-Age Neonates. Indian J Pediatr 89, 1034–1036 (2022). https://doi.org/10.1007/s12098-022-04175-3
8. Singamala, R. R., Subramanian, P., &Chitgupikar, S. R. (2023). A Cross-Sectional Study Comparing the Efficacy of Various Growth Charts in Evaluating the Incidences of Small for Gestational Age and Large for Gestational Age at Birth Among Liveborn Neonates Delivered at a Tertiary

Teaching Hospital. Cureus, 15(4), e38058. https://doi.org/10.7759/cureus.38058

9. Anand, P., Thomas, D., Agarwal, R., Thukral, A., Deorari, A. K., Paul, V. K., &Sankar, M. J. (2023). Comparison of regional versus global growth charts for the classification of small-for-gestational age neonates. Archives of disease in childhood. Fetal and neonatal edition, 108(1), 15–19. https://doi.org/10.1136/archdischild-2021-322457
10. Bagga, N., Reddy, K. K., Mohamed, A., Panigrahy, N., &Chirla, D. K. (2021). Quality improvement initiative to decrease extrauterine growth restriction in preterm neonates. Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition, 36(6), 1296–1303. https://doi.org/10.1002/ncp.10735
11. Bagga, N., Panigrahi, N., Germain, A., Namazova, I., Rahman, M. M., Saugstad, O. D., &Maheshwari, A. (2023). Extrauterine Growth Restriction: Need for an Accurate Definition. Newborn (Clarksville, Md.), 2(3), 198–202. https://doi.org/10.5005/jp-journals-11002-0072
12. Shrikant, K. N., Gracy, N. B., Pournami, F., Prithvi, A. K., Panackal, A. V., Prabhakar, J., & Jain, N. (2024). Reducing extrauterine growth restriction in very preterm neonates: A before-after intervention study. Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition, 39(5), 1239–1246. https://doi.org/10.1002/ncp.11165
13. Upadhyay, S., Pournami, F., Nandakumar, A., Prabhakar, J., Nair, P. M. C., & Jain, N. (2020). Outcome of Very Preterm Infants With Early Optimal Nutrition Strategy: A Comparative Cohort Study. Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition, 35(4), 708–714. https://doi.org/10.1002/ncp.10422
14. Vishal Vishnu Tewari, Sachin Kumar Dubey, Reema Kumar, Shakti Vardhan, C M Sreedhar, Girish Gupta, Early versus Late Enteral Feeding in Preterm Intrauterine Growth Restricted Neonates with Antenatal Doppler Abnormalities: An Open-Label Randomized Trial, Journal of Tropical Pediatrics, Volume 64, Issue 1, February 2018, Pages 4–14, https://doi.org/10.1093/tropej/fmx018
15. Nandakumar, A., Pournami, F., Prabhakar, J., Nair, P. M. C., & Jain, N. (2020). Exclusive Breast Milk vs. Hybrid Milk Feeding for Preterm Babies-A Randomized Controlled Trial Comparing Time to Full Feeds. Journal of tropical pediatrics, 66(1), 38–45. https://doi.org/10.1093/tropej/fmz028

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