JHGD
Journal of Human Growth and Development

www. jhgd.com.br

ORIGINAL ARTICLE

Birth Body Mass Index (BMI) of Late Preterm and Early-Term Newborns

Chiara Alzineth Silva Campos[a], Priscila Ferreira Vitor[b], Caliel Ribeiro Simas[c], Silvia Maira Pereira[d], Priscilla Rayanne E. Silva Noll[g], Ciro João Bertoli[e], Claudio Leone[f]

Open acess

[a]Universidade de São Paulo. Departamento de Saúde Ciclos da vida e Sociedade, São Paulo, SP, Brazil.

[b]Universidade de Taubaté. Departamento de Medicina. Taubaté, SP, Brazil.

[c]Universidade de Taubaté. Taubaté, SP, Brazil.

[d]Universidade de Taubaté. Departamento de Enfermagem e Nutrição. Taubaté, SP, Brazil.

[e]Universidade de Taubaté. Departamento de Medicina. Taubaté, SP, Brazil.

[f]Universidade de São Paulo. Departamento de Saúde Ciclos da vida e Sociedade, São Paulo, SP, Brazil.

[g]Instituto Federal Goiano - Campus Ceres, Ceres, Goiás, Brazil.

Corresponding author
chiaracampos@gmail.com

Manuscript received: november 2023
Manuscript accepted: january 2024
Version of record online: april 2024

Orcid authors
Chiara Alzineth Silva Campos.https://orcid.org/0000-0002-5127-3450

Priscila Vitor Alves Ferreira Freires. https://orcid.org/0009-0004-2614-3461

Caliel Ribeiro Simas. https://orcid.org/0009-0001-1453-1166

Silvia Maira Pereira. https://orcid.org/0000-0002-1827-6588

Ciro João Bertoli. Doutor.https://orcid.org/0000-0002-5666-5189

Claudio Leone. https://orcid.org/0000-0003-1324-0401

Priscilla Rayanne E. Silva Noll https://orcid.org-/0000-0003-3715-1956

Abstract

Introduction: the nutritional status and the growth achieved by the newborn until birth have been used as a marker/indicator of early risks of morbidity and mortality. Even though BMI is a good marker of adiposity and is commonly used in older children and adults, there are still gaps in knowledge and there are few studies on the behavior of BMI according to gestational age.

Objective: to analyze the Body Mass Index (BMI) at the birth of late preterm newborns (34th to 36th week of gestational age) and early-term newborns (37th to 38th week of gestational age) and according to gestational age.

Methods: this is a descriptive, analytical, and quantitative study with 2,486 newborns, developed from the project's database "Biometric characteristics at birth, of young adult women's babies, in a municipality with a high human development index." After collection, data consistency was verified. The analysis evaluated measures of central tendency and dispersion of values, in addition to correlations and regressions of their evolution according to gestational age.

Results: BMI scores Z distribution wasn't different between male and female late preterm newborns as in early-term newborns. The same was observed concerning gestational ages. In terms of absolute BMI values, it was observed that late preterm newborns had a lower BMI (12.6 kg/m2) than early-term newborns (13.6 kg/m2). However, considering their gestational age, late preterm newborns were proportionally bigger than early-term newborns. A proportionally higher rate of BMI growth was observed in late preterm newborns, with a tendency to slow down in early-term newborns. As for weight gain, from the 37th week of gestational age, it tends to decrease compared to the reference values.

Conclusion: Regarding the BMI reference values, early-term and late-preterm newborns are equivalent. Late-preterm newborns have the same BMI Z-scores as reference values as early-term newborns.

Keywords: newborn, prematurity, growth, body mass index.

Suggested citation: Campos CAS, Vitor PF, Simas CR, Pereira SM, Noll PRES, Bertoli CJ, Leone C. Birth Body Mass Index (BMI) of Late Preterm and Early-Term Newborns. *J Hum Growth Dev. 2024; 34(1):166-173.*
DOI: http://doi.org/10.36311/jhgd.v34.15834

Authors summary

Why was this study done?
Even though BMI is a good marker of adiposity and is commonly used in older children and adults, there are still gaps in knowledge and there are few studies on the behavior of BMI according to gestational age, particularly in the group currently also considered at risk.

What did the researchers do and find?
We analyzed the Body Mass Index (BMI) of late preterm newborns (born at 34 to 36 weeks of gestational age) and of early-term newborns (born at 37 and 38 weeks of gestational age), as well as the evolution of this index during pregnancy and found that late preterm and early-term newborns, considered at higher risk, when compared to full-term newborns, the BMI increases more intensely in the late preterm period (34th to 36th week of pregnancy), tending to slow down its growth speed in the period that corresponds to the early-term, 37th and 38th weeks of gestation.

What do these findings mean?
In relation to the BMI reference values, early premature and late premature newborns are equivalent. Late preterm newborns have the same BMI Z-scores as reference values as early-term newborns.

Highlights
We analyzed the Body Mass Index (BMI) of late preterm newborns and of early-term newborns, as well as the evolution of this index during pregnancy, and found that late preterm and early-term newborns, considered at higher risk, the BMI increases more intensely in the late preterm period (34th to 36th week of pregnancy), tending to slow down its growth speed in the period that corresponds to the early-term, 37th and 38th weeks of gestation.

INTRODUCTION

The nutritional status and the growth achieved by the newborn until birth have been used as a marker/indicator of early risks of morbidity and mortality[1,2], and even of morbidities that may occur at more advanced ages[3,4].

Global estimates show that 20 million babies are born with low birth weight in the world every year[5]. International data also show that around 15 million premature babies are born alive each year[6,7]. According to the Brazilian National Survey on Labor and Childbirth, the proportion of premature births was 11.3% in Brazil (2011/2012)[8], a condition in which it is particularly important to assess the nutritional status and growth of these babies until birth, because, in addition to assessing future risks, it may contribute to understanding possible problems that may have been caused to the fetus during pregnancy[9-11], besides to program nutrition more adequate to these babies postnatal needs.

In the postpartum period, it is possible to assess the conditions of the newborn (NB) also based on their gestational age at birth. In this classification, the newborn is categorized as preterm NB (born alive before the 37th week of gestation), early-term NB (born between 37 and 0/7 and 38 and 6/7 weeks of gestation), and full-term NB (born alive between 39 and 41 gestational weeks and 6 days)[12]. Among preterm newborns, most births correspond to those classified as being late preterm (LPT), whose gestational age is between 34 completed weeks and 36 weeks and 6 days[13-15].

The Body Mass Index (BMI), defined as weight in kilograms divided by height in squared meters, is highly correlated with body fat and is a widely used measure for obesity screening at different ages[16]. However, even though BMI is a good marker of adiposity and is commonly used in older children and adults, there are still gaps in knowledge and there are few studies on the behavior of BMI according to gestational age, particularly in the group currently also considered at risk (late preterm and early-term). Therefore, analyzing BMI in newborns becomes essential, as it is a population with a higher risk for short- and long-term adverse health repercussions.

For these reasons, the objective was to analyze the Body Mass Index (BMI) of late preterm newborns (born at 34 to 36 weeks of gestational age) and of early-term newborns (born at 37 and 38 weeks of gestational age), as well as the evolution of this index during pregnancy.

METHODS

Study design

This is a descriptive, analytical, and quantitative study based on the database of the project "Biometric characteristics at the birth of babies of young adult women in a municipality with a high human development index".

Study location and period

Which had data collected between May 2015 and March 2018, at the Maternity Ward of the Taubaté Regional Hospital in the state of São Paulo. The regional hospital is also the UNITAU Hospital School (Taubaté University) and 90% of the births in the city happen there[17].

Study population and eligibility criteria

From the 6,321 infants born alive during this period, newborns from single gestations, with low risk, and no pathologies were selected.

All babies born alive who were included for analysis were born from single gestations between 34 and 38 gestational weeks, from women with no complications during pregnancy, and presented at least the following data in their medical records: date of birth, mother's age, or mother's birthdate, type of gestation, type of labor, gestational age (GA), sex, birth weight, birth height.

Newborns who did not fit the described characteristics and/or did not present any record of the data established in the inclusion criteria were excluded from the study. Additionally, those with body measurements with more or less than 3 standard deviations from the average of the studied population were excluded.

At the end of these assessments, of the 6,321 newborns, 2,468 newborns remained (39.0% of the total) in the study, which included all 528 late preterm newborns (PTT NB) and all 1,940 early-term newborns (ET NB).

Among the newborns included in the study, 1,173 (47.5%) were female, and 1,295 (52.5%) were male.

Data collection

Anthropometric measurements were taken by healthcare professionals trained in their execution, measurement, and recording. Values were collected from birth registration books and, when necessary, complemented by checking information from the hospital's electronic medical records.

The measurement of the weight and height of newborns was carried out following the Technical Norms of the Food and Nutritional Surveillance System (SISVAN)18. For weight in kilograms, the scale was first turned on before the infant was placed on the equipment. After reaching zero on the scale, the newborn was carefully positioned in its center without a diaper, and the weight value was patiently observed until it stabilized on display for accurate registration. The height was measured in centimeters (cm) using an anthropometric ruler, with the newborn lying on a firm surface. With the help of a parent, the newborn's head was firmly supported against the fixed part of the equipment, with the neck and chin apart, shoulders, buttocks, and heels in contact with the surface, knees extended, and the soles of the feet in contact with the surface of the moving part of the equipment[18,19].

Data analysis

All necessary data were duly filled in from the newborns' medical records and copied to an Excel® spreadsheet for later consistency analysis. Comparisons of measures of central tendency and dispersion of values were performed, in addition to correlations and regressions (Mann-Whitney Test; D'Agostino - Pearson Test; Spearman Correlation Coefficient). For the statistical analysis, the following software programs were used: MedCalc v. 20.218 - 64 bit, CurveExpert Pro v. 2.0.4, GraphPad Prism v. 6.0, and GraphPad Instat v. 3.1.0.

All tables and graphs in this study had their titles simplified, as they refer to the population of mothers and newborn babies with gestational age (GA) between 34 and 38 weeks, from the city of Taubaté, between 2015 and 2018. We used Olsen IE[20] as a reference to analyze the BMI measures, weight, and height of newborns in table 2, table 3 and table 4.

Ethical and legal aspects of the research

The study was sent to Plataforma Brasil, in accordance with Resolution No. 466, of December 12, 2012[21], and authorized under opinion number 5,427,258.

RESULTS

The distribution of BMI between male and female late preterm newborns is similar. It is also similar among early preterm newborns of both sexes (table 1). In the same table, it is observed that in terms of absolute BMI values, late preterm newborns have a lower median BMI (12.6 kg/m^2) than the BMI of early-term newborns (13.6 kg/m^2).

In table 2, considering the distribution of all values, there is no difference in the z-score between the late preterm and early preterm groups. As for the distribution in percentiles, the values are systematically superior to the reference values.

Table 1: BMI distribution in kg/m^2 of late preterm NB (LPT NB) and early-term NB (ET NB) according to sex

BMI (kg/m^2)	LPT NB Male	LPT NB Female	LPT NB All	ET NB Male	ET NB Female	ET NB All
Median	12.7	12.6	12.6	13.7	13.5	13,6
CI* 95%	12.4 to 13.0	12.3 to 12.7	12.4 to 12.7	13.6 to 13.8	13.4 to 13.6	13.6 to 13.7
Average	12.7	12.5	12.6	13.7	13.5	13.7
(DP)	(1.5)	(1.5)	(1.5)	(1.3)	(1.3)	(1.3)
p10	10.9	10.5	10.8	12.2	12.1	12.1
p25	11.7	11.5	11.6	12.9	12.8	12.8
p75	13.7	13.4	13.5	14.6	14.5	12.8
p90	14.9	14.3	14.5	15.4	15.3	15.4
N	298	230	528	997	943	1940

CI*: Confidence Interval.

Table 2: Distribution of BMI z-score of late preterm NB (LPT NB) and early-term NB (ET NB)

BMI (z-score)	LPT NB	ET NB	Reference Values
Median	0.65	0.58	0.00
CI 95%	0.57 to 0.74	0.54 to 0.64	-
Average	0.62	0.58	-
(DP)	(0.9)	(0.8)	-
p10	-0.60	-0.44	-1.28
p25	0.02	0.06	-0.68
p75	1.27	1.15	0.68
p90	1.93	1.62	1.28
N	528	1940	-

CI* Confidence Interval / Comparison of medians Mann-Whitney Test p=0.1439 (non-significant).

Table 3: Birth weight Z-score distribution, in late preterm NB (LPT NB) and early-term NB (ET NB)

Weight at birth	LPT NB (z-score)	ET NB (z-score)	Reference Values*
Median	-0.01	-0.08	0.00
CI 95%	-0.11 to -0.08	-0.12 to -0.03	-
Average	0.05	-0.09	-
(DP)	(0.9)	(0.8)	-
p10	-1.09	-1.11	-1.28
p25	-0.65	-0.62	-0.68
p75	0.66	0.43	0.68
p90	1.42	0.96	1.28
N	528	1940	-

Comparison of medians: Mann-Whitney Test p=0.0192 (significant)

Table 4: Distribution of height Z-score at birth in late preterm NB (LPT NB) and early-term NB (ET NB)

Height At birth	LPT NB (z-score)	ET NB (z-score)	Reference Values*
Median	-0.55	-0.71	0.00
CI 95%	-0.67 to -0.49	-0.75 to -0.69	-
Average	-0.5	-0.72	-
(DP)	(0.8)	(0.7)	-
p10	--1.68	-1.62	-1.28
p25	-1.16	-1.19	-0.68
p75	-0.01	-0.26	0.68
p90	0.59	0.21	1.28
N	528	1940	-

Comparison of medians: Mann-Whitney Test p=0.0001 (significant)

The distributions of birth weight in the two groups are different (table 3). Considering their gestational age, late preterm newborns are proportionally heavier than early-term newborns, with a median practically equivalent to the reference value.

When comparing heights in z-score, the late-preterm newborns median is bigger than the early-term newborns median (table 4). Still, both values are smaller than the reference value median, which shows a greater distance from the height median than the one observed for the weight.

This behavior can be observed in the graphs of figure 1, figures A, B, C, and D, in which changes in the evolution trend of both parameters can also be observed from 37 weeks of gestational age.

Regarding the BMI in absolute values, kg/m2, (figure A), there is a tendency for a proportionally higher growth rate in late preterm newborns followed by a deceleration in growth in early-term newborns as gestational age increases.

In figure B, late preterm newborns have higher values of BMI z-score in relation to the reference values, indicating that those with lower gestational ages tend to be proportionally a little higher than their peers (reference values) and that after the 37th gestational week, there is a reduction in the BMI growth speed.

Regarding weight (figure C), it is noted that from the 37th week of gestational age, the weight tends to decrease with the reference value, while the height growth (figure D) tends to remain stable.

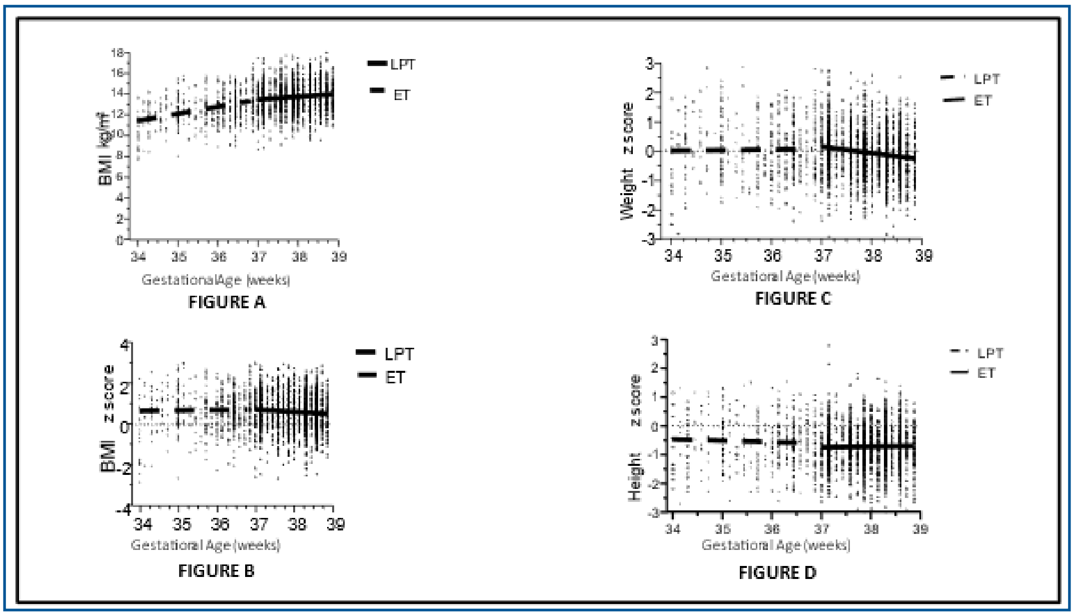

Figure 1: BMI evolution tendency, weight, and height at birth for LPT NB and ET NB, with gestational age evolution

DISCUSSION

In this study, late preterm newborns were proportionally larger than early-term newborns. Although there is a growing evolution in absolute BMI values for both genders, which is expected considering the gestational age, median values above those proposed by the reference value[21] are a consequence of a birth height below the reference value median at all gestational ages.

When analyzed in z-score, the BMI shows similar median values between preterm and early-term newborns, but when considering the reference value, the values of these two groups are lower than those observed in full-term newborns, regardless of their sex.

These findings corroborate the study that evaluated the evolution of fetal weight carried out in Campinas—SP. In this study, Cecatti *et al.*[22] found that the newborn's weight gain between the 27th and 38th gestational week was on average 200g/week and that there was a reduction in the speed of weight gain from the 39th to the 42nd week of pregnancy, which also affects the BMI values at birth.

This BMI behavior suggests that during pregnancy there is a non-proportional growth between fetus weight and height, which favors weight gain during the second pregnancy half. According to Cecatti *et al.*[22], maternal physiological characteristics, such as parity, weight, and height, as well as maternal pathologies can influence fetal growth, especially in the 3rd trimester of gestation.

An adequate growth assessment is necessary to indicate how satisfactorily the intrauterine needs of babies have been met[20,23]. In this sense, it is essential to be attentive to preterm newborns with low birth weight or when they are too small for their gestational age because they are the ones who have the highest risk of negative impacts, including for their neurodevelopment[20-26].

The evolution analysis of BMI percentiles and/or z-score in the study of sample populations, according to the gestational age, is important to analyze whether the 50 percentile (median) and the 10 and 90 percentiles, usually used to assess the intrauterine growth of newborns, show a trend like the one observed for the newborn group as a whole[20,27,28].

A relative limitation of this study is the selection of a specific urban community from the State of São Paulo population, which makes it difficult to extrapolate the data to the general population. Another limitation that is common to many studies involving growth studies is the accuracy of the measured data since the data were not collected strictly with a focus on the research. On the other hand, it is important to consider that they were collected by a team of professionals trained to do so correctly, as a routine of their service.

Furthermore, a relevant positive aspect of the research is that it resorted to a study population (universe), not a sample, which results in adequate representativeness of the results, even if it is exclusively for the newborn population in Taubaté. Although this may represent an obstacle to a broader generalization of the values obtained, it is no different from the difficulties in generalizing the results that are also observed when resorting to convenience samples, which also do not fully reflect the population universe that one wishes to analyze.

CONCLUSION

The distribution of absolute BMI values (kg/m^2) shows an increase with the evolution of gestational age for both male and female newborns, with BMI values for boys, generally, higher than those for girls.

In the late preterm and early-term newborns, considered at higher risk, when compared to full-term newborns, the BMI increases more intensely in the late preterm period (34th to 36th week of pregnancy), tending to slow down its growth speed in the period that corresponds to the early-term, 37th and 38th weeks of gestation.

Author Contributions

(CASC) conception and design of the study; data analysis, interpretation and article writing; (PVAFF) data acquisition and final approval of the version to be submitted (CRS) data acquisition and final approval of the version to be submitted ; (SMP) data acquisition and final approval of the version to be submitted (CJB) conception of the study; final approval of the version to be submitted (CL) conception and design of the study; data analysis and final approval of the version to be submitted.

Funding

Brazilian National Council for Scientific and Technological Development (CNPq 140060/2019-7)).

Conflicts of Interest

The authors declared that there is no conflict of interest.

REFERENCES

1. Dotinga BM, de Winter AF, Bocca-Tjeertes IFA, Kerstjens JM, Reijneveld SA, Bos AF. Longitudinal growth and emotional and behavioral problems at age 7 in moderate and late preterms. PLoS One [Internet]. 2019 Jan 31;14(1): e0211427. Available from: http://dx.doi.org/10.1371/journal.pone.0211427
2. Cao G, Liu J, Liu M. Global, Regional, and National Incidence and Mortality of Neonatal Preterm Birth, 1990-2019. JAMA Pediatr [Internet]. 2022 Aug 1;176(8):787–96. Available from: http://dx.doi.org/10.1001/jamapediatrics.2022.1622
3. Del Pino M, Nieto R, Meritano J, Rabosto Moleon R, Orden AB, Villafañe L, et al. Recommendations for the assessment of birth size and postnatal growth of preterm newborns. Arch Argent Pediatr [Internet]. 2020 Oct;118(5): S142. Available from: https://europepmc.org/article/med/32924411
4. Lee AC, Kozuki N, Cousens S, Stevens GA, Blencowe H, Silveira MF, et al. Estimates of burden and consequences of infants born small for gestational age in low and middle income countries with INTERGROWTH-21st standard: analysis of CHERG datasets. BMJ [Internet]. 2017 Aug 17;358: j3677. Available from: http://dx.doi.org/10.1136/bmj.j3677
5. UNICEF-WHO Low birthweight estimates: Levels and trends 2000–2015 [Internet]. [cited 2024 Apr 3]. Available from: https://www.unicef.org/reports/UNICEF-WHO-low-birthweight-estimates-2019
6. Chawanpaiboon S, Vogel JP, Moller A-B, Lumbiganon P, Petzold M, Hogan D, et al. Global, regional, and national estimates of levels of preterm birth in 2014: a systematic review and modelling analysis. Lancet Glob Health [Internet]. 2019 Jan;7(1): e37–46. Available from: http://dx.doi.org/10.1016/S2214-109X(18)30451-0
7. Blencowe H, Cousens S, Chou D, Oestergaard M, Say L, Moller A-B, et al. Born too soon: the global epidemiology of 15 million preterm births. Reprod Health [Internet]. 2013 Nov 15;10 Suppl 1(Suppl 1): S2. Available from: http://dx.doi.org/10.1186/1742-4755-10-S1-S2
8. Leal MC, Gama SG. Nascer no Brasil: sumário executivo temático da pesquisa. Rio de Janeiro: ENSP. 2014.
9. Olsen IE, Groveman SA, Lawson ML, Clark RH, Zemel BS. New intrauterine growth curves based on United States data. Pediatrics [Internet]. 2010 Feb;125(2):e214–24. Available from: http://dx.doi.org/10.1542/peds.2009-0913
10. Blair EM, Liu Y, de Klerk NH, Lawrence DM. Optimal fetal growth for the Caucasian singleton and assessment of appropriateness of fetal growth: an analysis of a total population perinatal database. BMC Pediatr [Internet]. 2005 May 24;5(1):13. Available from: http://dx.doi.org/10.1186/1471-2431-5-13
11. Lourenço N, Fernandes M, Gomes C, Resende C. Morbidade neonatal dos recém-nascidos pré-termo tardios comparados aos de termo precoce. Soc Sci Med [Internet]. 2017 Mar 30;27: 25876. Available from: https://dialnet.unirioja.es/servlet/articulo?codigo=5907015
12. College of Obstetricians and Gynecologists A. ACOG Committee Opinion No 579: Definition of term pregnancy. Obstet Gynecol [Internet]. 2013 Nov;122(5):1139–40. Available from: http://dx.doi.org/10.1097/01.AOG.0000437385.88715.4a

13. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller A-B, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet [Internet]. 2012 Jun 9;379(9832):2162–72. Available from: http://dx.doi.org/10.1016/S0140-6736(12)60820-4
14. Machado AK, Marmitt LP, César J. Late preterm birth in the far south of Brazil: a population based study. Brazilian Journal of [Internet]. 2016 Jun 1;16: 113–20. Available from: https://search.ebscohost.com/login aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=15193829&asa=Y&AN=117519866&h=craRtjiinSHxOz8ulGiNEOb%2FLyI7DKDFebLGBQHnAx2ZB7TUja2zY6OmUmtG%2F%2F4kZRcToVKjo4ic6DB31bSe9w%3D%3D&crl=c
15. Mohan SS, Jain L. Late preterm birth: preventable prematurity? Clin Perinatol [Internet]. 2011 Sep;38(3):547–55. Available from: http://dx.doi.org/10.1016/j.clp.2011.06.005
16. WHO Expert Committee on Physical Status: The Use and Interpretation of Anthropometry (1993: Geneva, Switzerland), World Health Organization. Physical status: the use of and interpretation of anthropometry, report of a WHO expert committee [Internet]. World Health Organization; 1995 [cited 2024 Apr 3]. Available from: https://iris.who.int/handle/10665/37003
17. Freires PVAF. Características biométricas ao nascimento, de filhos de mulheres adultas jovens, em um município de elevado índice de desenvolvimento humano [Internet]. Universidade de Sao Paulo, Agencia USP de Gestao da Informacao Academica (AGUIA); 2021. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1293310
18. Brasil. Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de Atenção Básica. Orientações para a coleta e análise de dados antropométricos em serviços de saúde: Norma Técnica do Sistema de Vigilância Alimentar e Nutricional-SISVAN. Ministério da Saúde Brasília, DF; 2011.
19. Sociedade Brasileira de Pediatria- SBP. Manual de Avaliação Nutricional. 2ª EDIÇÃO – ATUALIZADA - 2021/ Sociedade Brasileira de Pediatria. Departamento Científico de Nutrologia. São Paulo: SBP. 2021. 120 p. [cited 2024 Apr 3]. Available from: https://www.sbp.com.br/fileadmin/user_upload/_22962e-ManAval_Nutricional_-_2Ed_Atualizada_SITE.pdf
20. Olsen IE, Lawson ML, Ferguson AN, Cantrell R, Grabich SC, Zemel BS, et al. BMI curves for preterm infants. Pediatrics [Internet]. 2015 Mar;135(3): e572–81. Available from: http://dx.doi.org/10.1542/peds.2014-2777
21. Conselho Nacional de Saúde [Internet]. [cited 2024 Apr 3]. Available from: https://conselho.saude.gov.br/ultimas_noticias/2013/06_jun_14_publicada_resolucao.html
22. Cecatti JG, Machado MRM, Santos FFA dos, Marussi EF. Curve of normal estimated fetal weight values by ultrasound according to gestation age. Cad Saúde Pública [Internet]. 2000 Dec [cited 2024 Apr 3];16(4):1083–90. Available from: https://www.scielo.br/j/csp/a/M8B7pQSHvjzfCMJGLNNSJtB/abstract/?lang=en&format=html
23. Fenton TR, Cormack B, Goldberg D, Nasser R, Alshaikh B, Eliasziw M, et al. 'Extrauterine growth restriction' and 'postnatal growth failure' are misnomers for preterm infants. J Perinatol [Internet]. 2020 Mar 25 [cited 2024 Apr 3];40(5):704–14. Available from: https://www.nature.com/articles/s41372-020-0658-5
24. Lim J, Yoon SJ, Lee SM. Growth patterns of preterm infants in Korea. Clin Exp Pediatr [Internet]. 2022 Jan;65(1):1–9. Available from: http://dx.doi.org/10.3345/cep.2021.00234
25. Yoon SJ, Lim J, Han JH, Shin JE, Lee SM, Eun HS, et al. Identification of Growth Patterns in Low Birth Weight Infants from Birth to 5 Years of Age: Nationwide Korean Cohort Study. Int J Environ Res Public Health [Internet]. 2021 Jan 29;18(3). Available from: http://dx.doi.org/10.3390/ijerph18031206
26. Clark RH, Olsen IE, Spitzer AR. Assessment of neonatal growth in prematurely born infants. Clin Perinatol [Internet]. 2014 Jun;41(2):295–307. Available from: http://dx.doi.org/10.1016/j.clp.2014.02.001
27. Jamaluddine Z, Sharara E, Helou V, El Rashidi N, Safadi G, El-Helou N, et al. Effects of size at birth on health, growth and developmental outcomes in children up to age 18: an umbrella review. Arch Dis Child [Internet]. 2023 Dec;108(12):956–69. Available from: http://dx.doi.org/10.1136/archdischild-2022-324884
28. Davidson S, Natan D, Novikov I, Sokolover N, Erlich A, Shamir R. Body mass index and weight-for-length ratio references for infants born at 33–42 weeks gestation: A new tool for anthropometric assessment. Clin Nutr [Internet]. 2011 Oct 1;30(5):634–9. Available from: https://www.sciencedirect.com/science/article/pii/S0261561411000628

Resumo

Introdução: o estado nutricional e o crescimento alcançado pelo recém-nascido até o nascimento têm sido utilizados como marcador/indicador de riscos precoces de morbidade e mortalidade. Embora o IMC seja um bom marcador de adiposidade e seja comumente utilizado em crianças maiores e adultos, ainda existem lacunas no conhecimento e poucos estudos sobre o comportamento do IMC de acordo com a idade gestacional.

Objetivo: analisar o Índice de Massa Corpórea (IMC) de recém-nascidos de termo precoce (37ª a 38ª semana de idade gestacional) e pré-termos tardios (34ª a 36ª semana de idade gestacional) e sua evolução.

Método: trata-se de um estudo descritivo, analítico e quantitativo com 2.486 recém-nascidos, desenvolvido a partir do banco de dados do projeto "Características biométricas ao nascimento, de filhos de mulheres adultas jovens, em um município de elevado índice de desenvolvimento humano". Todos os dados necessários foram devidamente preenchidos a partir dos prontuários dos recém-nascidos e copiados para uma planilha Excel®. Após a coleta a consistência dos dados foi verificada. As análises avaliaram medidas de tendência central e dispersão de valores, além de correlações e regressões de sua evolução segundo a Idade gestacional.

Resultados: a distribuição do IMC entre os recém-nascidos pré-termo tardio do sexo masculino e sexo feminino foi semelhante. Assim como entre os termos precoces de ambos os sexos. No conjunto, em termos de valores absolutos de IMC, observou-se que os pré-termos tardios têm IMC menor (12,6 kg/m^2) do que o IMC dos termos precoces (13,6 kg/m^2). No entanto, os recém-nascidos pré-termos tardios são, considerando sua idade gestacional, proporcionalmente maiores do que os termos precoces. No caso do IMC, proporcionalmente se observa uma velocidade maior de crescimento no pré-termo tardio com uma tendência à desaceleração do crescimento no termo precoce. Quanto ao ganho de peso, a partir da 37ª semana de idade gestacional ele tende a diminuir em comparação com o referencial.

Conclusão: em relação ao referencial os termos precoces e os pré-termos tardios são equivalentes em termos de IMC. O prematuro tardio tem o mesmo IMC quando comparado com seus pares e com o termo precoce em escore z.

Palavras-chave: recém-nascido, prematuridade, crescimento, índice de massa corporal (IMC).