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ORIGINAL ARTICLE

A systematic method to evaluate newborn weight loss and its influence on breastfeeding success

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Abstract

Introduction and objectives: Increasing evidence shows that newborn weight loss is significantly influenced by the type of labour among other factors, implying a wider understanding of weight loss and its context to intervene accordingly. Given the importance of breastfeeding and the impact of infant formula use on its success, we aimed to understand the impact of the application of nomogram weight loss tool in initiating infant formula. **Methods:** This study included 206 newborns in a non-randomised clinical trial, who were divided into two groups. In the intervention group, weight loss was managed through the use of the "Early Weight Loss Nomogram", rather than with clinical experience associated with weight loss percentage, the standard type of care. We analysed the characteristics of mothers, newborns, and labours and their influence on each group. **Results:** We found that the introduction of formula milk due to weight loss tended to diminish (61.3% vs. 38.7%, p = 0.082) and nurses' suggestions dropped to zero in the intervention group. The intervention group reported a longer period of exclusive breastfeeding, up to nearly six months of age. The babies who were not breastfed during the first hour of life were more often supplemented (78.6% vs. 21.4%, p < 0.001) and those with skin-on-skin contact were given a lower proportion of formula milk (69.8% vs. 30.2%, p < 0.001). **Discussion:** Application of the nomogram allowed the introduction of formula milk in more selected cases. This tool should be applied in healthcare units because it increases health professionals' awareness of the criteria for formula supplementation.

Keywords: Newborn weight loss. Breastfeeding. Supplementation. Infant formula. Nomograms.

Avaliação da perda ponderal do recém-nascido através de um método sistemático e a sua influência no sucesso do aleitamento materno

Resumo

Introdução e objetivos: Há evidência que demonstra como a perda ponderal do recém-nascido é influenciada por vários fatores, sendo importante uma compreensão contextualizada da mesma e intervir criteriosamente. Dado o impacto que a utilização de leite artificial tem no sucesso do aleitamento materno, estudámos a influência da aplicação de um nomograma de perda ponderal na introdução de leite artificial. **Métodos:** O estudo clínico não randomizado incluiu 206 recém-nascidos. No grupo de intervenção, a perda ponderal foi avaliada com o uso do "Nomograma de Perda Ponderal", em contraste com o grupo de controlo que foi avaliado pela perda ponderal percentual, o método de avaliação mais amplamente utilizado. Analisamos as características da mãe, do recém-nascido e do tipo de parto, e a sua influência em cada grupo. **Resultados:** No

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grupo de intervenção, a introdução do leite artificial devido a perda ponderal do recém-nascido diminuiu (61.3% vs. 38.7%, p = 0.082) e não ocorreu em nenhum caso por sugestão da equipa de enfermagem. No grupo de intervenção, verificou-se um maior período de aleitamento materno exclusivo, até aos 6 meses de idade. Os recém-nascidos que não foram amamentados durante a primeira hora de vida foram mais frequentemente suplementados (78.6% vs. 21.4%, p < 0.001) e aqueles que tiveram oportunidade de contacto pele-pele verificaram uma menor probabilidade de introdução de leite artificial (69.8% vs. 30.2%, p < 0.001). **Discussão:** A aplicação do nomograma permitiu a introdução do leite artificial em casos mais selecionados. Esta ferramenta deverá ser usada de modo a ser mais criteriosa a introdução de leite artificial, promovendo o sucesso do aleitamento materno com impacto na saúde pública.

Palavras-chave: Perda ponderal do recém-nascido. Aleitamento materno. Suplementação. Fórmula. Nomograma.

Keypoints

What is known

- Globally, clinical experience and absolute weight loss percentage determine the initiation of supplementation with formula milk.
- It is common to have a higher than expected weight loss percentage; it occurs earlier than expected, and significantly differs according to the type of labour.
- Infant formula given during the first days of life is related to a higher risk of early cessation of breastfeeding.

What is added

- Newborn weight loss should be contextualised because several factors contribute to weight loss. Application of the nomogram allows health professionals to contextualise the newborn's weight loss, introducing formula milk in more selective cases.
- Its application in populations with high caesarean section rates can be especially useful.
- After applying the nomogram, we found higher rates of exclusive breastfeeding at 6 months of age.

Introduction

Breastfeeding is the ideal way to nourish healthy newborns as well as newborns with any medical condition, such as pre-term babies. Human milk is recognised as the natural way of feeding newborns and is known for its enormous advantages for the health of babies and mothers' health[1]. Given these facts, UNICEF and WHO recommend exclusive breastfeeding for the first six months of life, supplemented with other foods until two years of age or more[2].

It is extremely important to address low breastfeeding rates in developed countries in order to improve health and reduce costs. This means understanding that breastfeeding is more than just food and that all healthcare professionals should take responsibility for this public health issue[3].

On a national level, a study showed that initiation of breastfeeding was 87.1%, but only 21% exclusively breastfed until six months of life, below the reported worldwide level of 38%[4]. One of the WHO's aims for 2025 is to reach 50% of exclusive breastfeeding until six months of age, reaffirming the importance of initiatives that promote the continuation of breastfeeding[5]. According to MB McCoy et al., infant formula given during the first days of hospital stay is associated with a two to six times higher risk of early weaning[6]. Frequently, the decision to give infant formula is associated with the perception of excessive weight loss.

Overall, it is known that a full-term newborn can lose up to 10% of their weight during the first days of life and recover their birth weight between the 10th and 14th day of life. However, Ian M Paul et al. have shown that a higher weight loss is common, occurs earlier than expected, and significantly differs according to the type of labour, and this difference persists throughout the weight recovery period, which can be longer than expected. A study performed by Kaiser Permanente hospitals in Northern California between 2009 and 2013 created a weight nomogram analysing the data of 161,471 newborns, which shows hour-by-hour weight loss trajectories during birth hospitalisation for generally healthy-term newborns and their recovery during the first 30 days of life[7]. Increasing evidence has demonstrated that using this nomogram allows a significant reduction in the introduction of infant formula[8]. We aimed to understand the impact of its usage in our population on exclusive breastfeeding and breastfeeding duration, compared to managing accordingly with clinical experience regarding weight loss percentage.

Methods

Our study was a nonrandomised clinical trial that included 206 newborns born between July and August 2020 at Hospital CUF Descobertas, a private hospital located in Lisbon, Portugal. The characteristics of mother and baby demographics, type of labour and feeding

method, and hospital stay were analysed. Pre-term newborns (classified as those born before 37 weeks of pregnancy) and newborns who needed admission to special care units were excluded, except if phototherapy was the only reason for admission to special care.

They were divided into two groups: a control group that included those born in July 2020 and an intervention group that included those born in August 2020. In the control group, newborns' weight loss was managed according to clinical experience regarding the weight loss percentage, which is considered as the standard type of care; and in the intervention group, weight loss was interpreted and managed through the use of the "Early Weight Loss Nomogram". The nomogram is available at *https://newbornweight.org*, a tool that considers several data such as birth weight, time and date of birth, type of labour, and feeding method. Specifically, in our study, given its objectives, the feeding method experienced was exclusive breastfeeding. Birth weight loss is shown through a percentile graph. When birth weight loss was above the 75th percentile according to the nomogram, supplementation with expressed breast milk was administered. After six hours, if there was no improvement in newborn weight and we found difficulties expressing breast milk, we gave formula milk. Breastfeeding support was optimised, aiming to return to exclusive breastfeeding. Data were collected among birth registrations, nurse teams, and with the mother. The collected data were saved in Microsoft Excel®.

Written informed consent was obtained from all participant mothers. The study protocol was approved by the ethics committee of Hospital CUF Descobertas and complied with the principles of the Declaration of Helsinki.

Statistical analysis

SPSS 23 (IBM SPSS Statistics, IBM Corporation, Armonk, NY, EUA) software was used for statistical analyses. Normal data distribution was verified using the Kolmogorov-Smirnov test. Significant differences between the groups were analysed using the t-test and Mann-Whitney U test, as appropriate. Pearson's chi-square test and Fisher's exact test were used to compare qualitative data. Differences were considered statistically significant when $p < 0.05$.

Results

The demographic and clinical characteristics of the mothers and newborns are presented in table 1 and 2, respectively. Of total 204 mothers, the protocol was not applied to 98, and the protocol was applied to the remaining 106 mothers.

For the total sample, the mother's mean age was 34.7 years and 74.5% (n = 152) had attended or finished college. 47.6% (n = 97) had had a previous delivery, and 28.9% (n = 59) reported having difficulties breastfeeding with their previous children. As a median, mothers were breastfed for up to three months as children themselves. The father was present in 88.2% (n = 180) of deliveries.

For mother's parameters, age, education, parity, breastfeeding difficulties in prior pregnancy, mother's duration of breastfeeding, mother's comorbidities, and father presence during labour, the participants did not present any differences at the beginning of the study, proving the homogeneity of the recruited sample.

The percentage of health problems among mothers was similar. There were 21 (10.2%) mothers with gestational diabetes, 11 (5.3%) with hypothyroidism, 9 (4.4%) with arterial hypertension, 1 (0.5%) with anxiety disorder, 1 (0.5%) with depressive syndrome and 1 (0.5%) with polycystic ovary syndrome. The other nine mothers had other health issues not detailed in the clinical process.

A total of 206 newborns were characterised (there were 2 twin pregnancies). There were 51.9% (n = 107) males. The mean gestational age was 38 weeks and 6 days, the mean birth weight was 3,159 grammes, and the mean discharge weight was 2,952 grammes. The median weight loss percentage was 6.70%, and no differences were found before and after application of our protocol, 7.22% and 6.24%, respectively ($p = 0.072$).

The median Apgar score in the first, fifth, and tenth minutes was 9, 10, and 10, respectively. The median length of hospital stay was 62 hours. There were no statistically significant differences between the groups for these parameters. Globally, there was a similar distribution between genders, but a statistically significant difference occurred in gender ($p < 0.05$) between before and with protocol application, with a higher percentage of female newborns in the group in which the protocol was applied.

Regarding the type of labour, 59.7% (n = 123) were caesarean sections and 59.3% were performed electively. Vaginal delivery corresponded to 15.1% (n = 31), 21.8% (n = 45) used suction cups, and 3.4% (n = 7) used forceps. Skin-on-skin contact was guaranteed in 25.9% (n = 53) and breastfeeding during the first hour of life occurred in 86.4% (n = 178). No statistically significant differences were found between the previous variables.

Formula milk was given to 49.5% (n = 102) of the newborns. The same relative frequency was found before and after our protocol application (49.5%), for n = 49 and n = 53, respectively. There was no statistically significant difference regarding the introduction of formula milk ($p = 0.996$).

Table 1. Characteristics of the mothers

	Total (n = 204)	Before applying our protocol (n = 98)	During application of our protocol (n = 106)	p
Age (years)*	34.70 (± 4.33)	34.94 (± 4.09)	34.48 (± 4.54)	0.442§
Education†				
Secondary education	52 (25.5)	22 (22.5)	30 (28.3)	0.361¶
Tertiary education	152 (74.5)	76 (77.6)	76 (71.7)	
Parity†				
Multiparity	97 (47.6)	48 (49.0)	49 (46.2)	0.852¶
Breastfeeding difficulties in prior pregnancy†	59 (28.9)	35 (35.7)	24 (22.6)	0.063¶
Mother's age when she stopped being breastfeeding during her childhood (months)‡	3.0 (0.5-7.0)	3.0 (1.0-9.0)	3.0 (0.0-6.0)	0.286**
Mother's comorbidities†	53 (26.0)	25 (25.5)	28 (26.4)	0.915¶
Father present during labour†	180 (88.2)	85 (86.7)	95 (89.6)	0.528¶

*Mean (± standard deviation).
†n (percentage).
‡Median (lower quartile-upper quartile).
§t-test.
¶Pearson's Chi-square test.
**Mann-Whitney U test.

Differences in formula intake are presented in figure 1.

The reasons for the introduction of infant feed formula are described in table 3. In only 49.0% (n = 50) of newborns who received formula milk, the reason was registered in the newborn's clinical file.

Regarding the reasons for formula milk intake, 51% (n = 52) were at the mother's request and 30.4% (n = 31) were due to the newborn's weight loss. There was a reduction in infant formula introduction due to newborn weight loss before and during the protocol application, since of these 31 cases, 61.3% (n = 19) were before the protocol and 38.7% (n = 12) during protocol application; however, no statistical significance was found. The formula milk intake by nurse's suggestion was verified in 5.9% (n = 6) of cases, and all of them were before the application of the protocol; thus, significant differences were found (p = 0.014). Doctors' prescriptions represented 2.0% (n = 2) of the cases of formula introduction, with no differences between groups.

Other reasons registered for infant formula introduction were: mother's exhaustion (n = 1), long gap between newborn breastfeeding opportunities (n = 1), difficulty in breastfeeding adaptation (n = 3), hypoglycaemia (n = 1), emergency surgery needed (n = 1), short stay in neonatology nursery (n = 1) and twin pregnancy (n = 2).

After one month, all mothers were contacted regarding the type of feeding their infants were receiving, and 200 answers were collected. Exclusive breastfeeding was maintained in 62% (n = 124). Formula milk was introduced in 27.5 % (n = 55) of infants and breastfeeding was stopped in 10.5% (n = 21). A higher proportion of infants fed with formula milk was found (p < 0.05) within the protocol application group.

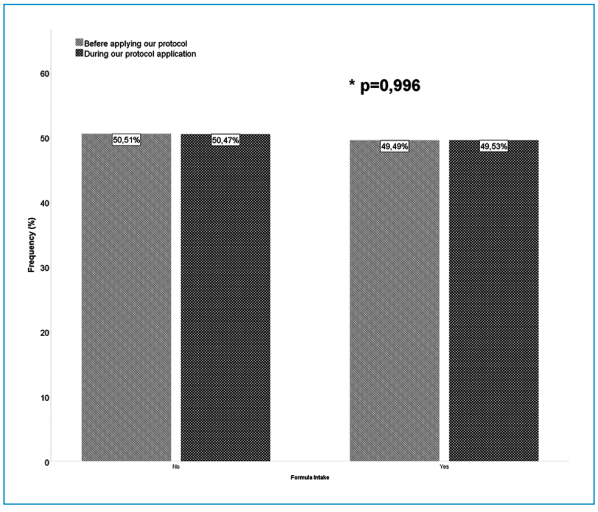

Figure 1. Differences in formula intake before and during application of our protocol.
*Pearson's chi-square test.

The type of infant feeding after the first month of life and duration of breastfeeding after two years of life are presented in table 4.

Table 2. Characteristics of the newborns

	Total	Before applying our protocol	During application of our protocol	p
Sex†				
Male	107 (51.9)	62 (61.6)	45 (42.1)	0.007¶
Female	99 (48.1)	37 (37.4)	62 (57.9)	
Gestational age (weeks)*	38.84 (± 1.09)	38.82 (± 0.93)	38.85 (± 1.22)	0.850§
Birth weight (grammes)*	3,159.29 (± 425.21)	3,178.34 (± 367.29)	3,141.65 (± 473.60)	0.547§
Discharge weight (grammes)*	2,952.86 (± 361.00)	2,945.80 (± 339.17)	2,959.34 (± 381.37)	0.789§
Weight loss (percentage)*	6.70 (± 3.86)	7.22 (± 3.89)	6.24 (± 3.78)	0.072§
Hospital stay duration in hours (hours)‡	62 (45-69)	62 (45-72)	62 (45-68)	0.393**
APGAR 1 min‡	9 (9-9)	9 (9-9)	9 (9-9)	0.168**
APGAR 5 min‡	10 (10-10)	10 (10-10)	10 (10-10)	0.633**
APGAR 10 min‡	10 (10-10)	10 (10-10)	10 (10-10)	0.608**
Induced labour†	79 (38.5)	40 (40.8)	39 (36.4)	0.567¶
Delivery method†				
Vaginal	31 (15.1)	14 (14.1)	17 (15.9)	0.846¶
Forceps	7 (3.4)	1 (1.0)	6 (5.6)	0.123¶
Suction cup	45 (21.8)	20 (20.2)	25 (23.4)	
Caesarean	123 (59.7)	64 (64.6)	59 (55.1)	
Skin-on-skin contact†	53 (25.9)	25 (25.5%)	28 (26.2%)	0.914¶
Breastfeeding during the first hour of life†	178 (86.4)	87 (87.9%)	91 (85.0%)	0.685¶

*Mean (± standard deviation).
†n (percentage).
‡Median (lower quartile-upper quartile).
§t-test.
¶Pearson's Chi-square test.
**Mann-Whitney U test.

Table 3. Reasons that motivated starting formula milk

	Total, n (%) (n = 102)	Before applying our protocol, n (%) (n = 49)	During application of our protocol, n (%) (n = 53)	p
Mother's choice	52 (51.0)	23 (46.9)	29 (54.7)	0.552*
Newborn weight loss	31 (30.4)	19 (38.8)	12 (22.6)	0.082*
Doctor's prescription	2 (2.0)	1 (2.0)	1 (1.9)	†
Nurse's suggestion	6 (5.9)	6 (12.3)	0 (0.0)	0.014*
Other reasons	11 (10.7)	0 (0.0)	11 (20.8)	0.011*

*Pearson's Chi-square test.
†Assumed p > 005.

Two years later, we contacted all the mothers to ascertain the total duration of exclusive breastfeeding. Regarding duration of exclusive breastfeeding, 115 mothers answered (62 of the control group and 53 of the intervention group), and regarding total duration of breastfeeding, only 140 mothers answered (75 of the control group and 65 of the intervention group).

The median duration of exclusive breastfeeding was six months and that of breastfeeding was 9 months.

No statistically significant differences were found between the groups for these parameters; however, there was a trend towards a longer duration of exclusive breastfeeding with the application of the protocol (6 months vs. 5.5 months; p = 0.057).

Table 4. Type of infant feeding through life time

	Total (n = 200)	Before applying our protocol (n = 93)	During application of our protocol (n = 107)	p
Exclusive breastfeeding‡	124 (62)	60 (64.5)	64 (59.8)	0.025*
Formula milk‡	21 (10.5)	4 (4.3)	17 (15.9)	
Both‡	55 (27.5)	29 (31.2)	26 (24.3)	
Duration of breastfeeding after two years of life				
Exclusive breastfeeding, months§	6.0 (4.0-6.0)	5.5 (4.0-6.0)	6.0 (5.0-6.0)	0.057†
Breastfeeding duration, months§	9.0 (5.0-19.0)	9.0 (5.0-18.0)	10.0 (5.0-23.0)	0.754†

*Pearson's Chi-square test.
†Mann-Whitney U test.
‡n (percentage).
§Median (lower quartile-upper quartile).

Factors related to formula milk intake during the hospital stay of newborns are presented in table 5.

The babies who were supplemented with formula milk stayed in hospital for significantly longer (66.5 hours vs. 50 hours, $p < 0.001$). The babies who were not breastfed during the first hour of life more frequently had formula milk (78.6% vs. 21% 4, $p < 0.001$) and babies with skin-on-skin contact were less frequently supplemented with formula milk (69.8% vs. 30.2%, $p < 0.001$).

Discussion

Among both groups, over 70% of the mothers had completed tertiary education, which is not representative of the Portuguese reality[9]. In developed countries, higher rates of breastfeeding occur among highly educated mothers[10].

Approximately 58% of the mothers had difficulties breastfeeding in previous pregnancies, and the mother's median age when she stopped being breastfed during her childhood was three months of age. This is very representative of the generation of mothers born during the 1980s and 1990s[11].

Caesarean section rates were above average, corresponding to almost 60% of total labours, 59% of which were electively performed. Skin-on-skin contact, which is more difficult to ensure after caesarean section, occurred in 26% of the cases. Newborns that were born after a caesarean section and did not have skin-on-skin had a higher risk of initiating formula milk[12].

There are several reasons to start formula milk, and the mother's choice is one of them. This was the reason in 51% of the cases where formula milk was introduced, with similar rates between both groups. This choice can be made due to lack of information and absence of prenatal education, previous difficulties in breastfeeding, and the fact that the mother was not breastfed at all or only for a short period.

Newborn weight loss as a reason to start formula milk reduced from 61.3% to 38.7% after applying the weight nomogram. In addition, starting formula milk after the nurses' suggestion dropped to zero cases during the protocol application. There was no statistically significant difference regarding the introduction of formula milk, and different aspects other than weight loss justified the introduction of formula milk in the protocol group. This can be explained by the increased awareness among the health team regarding the weight loss criteria to start formula milk and the search for other reasons to justify its introduction. Also, it shows that before the protocol, the introduction of formula milk was probably wrongly attributed to excessive weight loss, in some cases.

In both groups, the duration of hospital stay was longer among the newborns who received formula milk, probably because they had excessive weight loss and needed medical supervision.

After the first month of life follow-up, there were more cases of the introduction of formula milk among the group in which the protocol was applied, 4.3% compared with 15.9%. This probably happened because formula milk was introduced during the first month of follow-up consultations in a primary care setting where this nomogram is unknown among physicians and rarely used. In addition, another probable contributing factor, a prompt follow-up supporting breastfeeding with a lactation specialist, such as an international lactation consultant, was lacking in most cases after discharge from hospital.

Table 5. Factors related to formula milk intake during hospital stay of newborns

	Formula intake		p
	No	Yes	
Breastfeeding difficulties in prior pregnancy†			
Yes	38 (64.4)	21 (35.6)	0.025¶
No	17 (40.5)	25 (59.5)	
Education†			
Basic education	2 (100.0)	0 (0.0)	0.295¶
Secondary education	23 (46.0)	27 (54.0)	
Tertiary education	78 (51.7)	73 (48.3)	
Mother's duration of breastfeeding, months‡	3 (0-60)	3 (0-24)	0.645**
Gestational age, months*	38.94 (± 1.03)	38.73 (± 1.13)	0.160§
Newborn birth weight, grammes*	3,152.22 (± 425.14)	3,166.49 (± 427.27)	0.810§
Newborn discharge weight, grammes*	2,932.29 (± 327.88)	2,973.64 (± 392.15)	0.414§
Weight difference between discharge and birth, grammes*	–219.56 (± 233.52)	–192.85 (± 131.19)	0.315§
Hospital stay duration, hours‡	50.0 (31.0-88.0)	66.5 (36.0-120.0)	< 0.001**
Induced labour†			
Yes	45 (39.8)	68 (60.2)	0.152¶
No	58 (63.0)	34 (37.0)	
Delivery method†			
Vaginal	59 (71.1)	24 (28.9)	0.002¶
Caesarean	45 (36.6)	78 (63.4)	
Skin-on-skin contact†			
Yes	37 (69.8)	16 (30.2)	< 0.001¶
No	66 (43.4)	86 (56.6)	
Breastfeeding during the first hour of life†			
Yes	98 (55.1)	80 (44.9)	< 0.001¶
No	6 (21.4)	22 (78.6)	

*Mean (± standard deviation).
†n (percentage).
‡Median (lower quartile-upper quartile).
§t-test.
¶Pearson's Chi-square test.
**Mann-Whitney U test.

Duration of breastfeeding was longer among the group in which the protocol was applied, without a statistically significant difference. According to WHO recommendations, breastfeeding should be continued up to the age of two years or beyond, as mutually desired by the mother and child, given all its benefits. Although our results are not statistically significant, they are close to this recommendation.

Globally, the rate of introduction of formula milk was similar between both groups, among 49.5% of the newborns. Regardless of application of the nomogram, prompt follow-up with an international lactation consultant in both groups contributed to similar breastfeeding rates. Our intervention was short, and more breastfeeding educational programmes are needed to support healthcare teams. Frequent change among team members could influence the breastfeeding support given to mothers.

Application of the nomogram helps contextualise newborn weight loss and, therefore, introduce formula milk in more selected cases. In the case of excessive weight loss, the newborn-mother dyad should be evaluated, and necessarily means supplementation with formula milk. Given the fact that newborn weight loss is physiologically higher after caesarean section, the use of this nomogram is useful in order to decrease formula supplementation, in a context of high caesarean rates[13].

Our goal was to improve our clinical judgement and provide formula milk in more selected cases. Our results showed that we could introduce formula milk in more selected cases, following more solid criteria.

We consider that our study has several limitations. The fact that the introduction of formula milk during hospital stay, the duration of exclusive breastfeeding and full breastfeeding were not statistically different between groups, can be explained by the small sample and a need to improve our support to mothers and newborns regarding their breastfeeding difficulties.

The study was conducted during July and August, when there is a high rotation of healthcare team members, due to summer holidays. This limits the engagement of the healthcare team members with the study and the regular provision of breastfeeding support and application of the protocol when breastfeeding difficulties arise. This can be illustrated by the fact that the reason to start formula milk was registered in less than 50% of the newborns' clinical files. The poor completion of clinical files is a significant limitation of our study and reminds us of the importance in creating ways to engage healthcare teams to fill in clinical files as part of their daily routine.

This nomogram has not yet been validated in the Portuguese population. However, the nomogram was based on the Californian population, which has some similarities to ours. Further studies are needed with a larger sample of newborns from different health services in different social backgrounds.

We conclude that application of the nomogram appears to increase exclusive breastfeeding rates at the six months of age, and to decrease formula milk supplementation following suggestions from healthcare team members.

Authors' contribution

Carlota Veiga de Macedo: Conception and design of the study, report, review or other type of work or paper. Acquisition of data either from patients, research studies, or literature. Analysis or interpretation of data either from patients, research studies, or literature. Drafting the article. Critical review of the article for important intellectual content. Final approval of the version to be published. Agreement to be accountable for the accuracy or integrity of the work. Catarina Schrempp Esteves: Acquisition of data either from patients, research studies, or literature. Analysis or interpretation of data either from patients, research studies, or literature. Drafting the article. Critical review of the article for important intellectual content. Final approval of the version to be published. Agreement to be accountable for the accuracy or integrity of the work. José Pedro Pereira: Analysis or interpretation of data either from patients, research studies, or literature. Drafting the article. Critical review of the article for important intellectual content. Final approval of the version to be published. Agreement to be accountable for the accuracy or integrity of the work.

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Conflicts of interest

None.

Ethical disclosures

Protection of human and animal subjects. The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the International Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of data. The authors declare that they have followed the protocols of their work centre on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Use of artificial intelligence for generating text. The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

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