

Knowledge of Family Health Strategy professionals about biological neonatal screening

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Abstract

Biological neonatal screening, popularly known as “heel prick test”, is a preventive test capable of identifying six diseases in newborns, namely: Phenylketonuria, Congenital Hypothyroidism, Sickle Cell Disease and other haemoglobinopathies, Cystic Fibrosis, Congenital Adrenal Hyperplasia and Biotinidase deficiency. This study aimed to evaluate the knowledge of Family Health Strategy professionals about biological neonatal screening. A descriptive, exploratory and quantitative study was carried out, developed with professionals from the Family Health Strategy team in the Basic Health Units of a municipality in the northwest of the state of Paraná. Data was collected through a form on the Google Forms platform and in printed material, analyzed descriptively using absolute and relative frequencies. It was evidenced that of the 69 professionals surveyed, 39 do not know how to list which diseases the test identifies (56.5%), 28(40.6%) indicated the ideal period as being between the 3rd and 5th day of life; and 20(29%) indicated the period before 48 hours of life, 46 (66.7%) do not feel capable of guiding parents about the test. After the birth of the child, 34(49.3%) professionals did not verify whether the test was performed. It was concluded, therefore, that the knowledge and attitude of professionals from the Family Health Strategy Teams in relation to biological neonatal screening is insufficient, and shows the importance of continuing education, that professionals expand their knowledge and feel safe to guide in relation to the heel prick test effectively.

Keywords: Family Health Strategy. Child Health. Neonatal screening.

INTRODUCTION

Biological neonatal screening (BNS), popularly known as the “heel prick test”, is a preventive test capable of early identification of six diseases in newborns, namely: Phenylketonuria, Congenital Hypothyroidism, Sickle Cell Disease and other haemoglobinopathies, Cystic Fibrosis, Congenital Adrenal Hyperplasia and Biotinidase Deficiency, the latter of a metabolic, genetic, enzymatic and endocrinological nature. The test is performed using a blood sample collected from the heel of the newborn, ideally obtained from the 3rd to the 5th day of life, in order to guarantee an early diagnosis and avoid false negatives¹.

Screening consists of quantifying the concentration of Phenylalanine (Phe) in the blood using samples obtained on filter paper. The detection of the increase in Phe is essential for the screening process, and for that, it is recommended that the collection be performed after 48 hours of the child's birth, thus guaranteeing the protein intake. During this period, even children considered at high risk, who have not had contact with breast milk, can be subjected to material collection, provided they are on a parenteral diet containing essential amino acids².

On June 6, 2001, the National Neonatal

Screening Program (NNSP) was created in Brazil, aiming to expand access to BNS, and increase test coverage to 100% of live births in the country, in addition to ensuring follow-up and treatment newborns with screened pathologies (phenylketonuria, congenital hypothyroidism, sickle cell disease and other hemoglobinopathies, cystic fibrosis, congenital adrenal hyperplasia and biotinidase deficiency)². However, it is evident that this coverage has not been achieved in the country, according to data from the Ministry of Health, in the period from 2016 to 2020 the percentage of newborns who underwent TNB ranged from 80.0 to 83.9%, and in 2020 coverage was 82.5%³.

When evaluating the percentage of newborns who underwent the test up to the fifth day of life, an even lower coverage is observed, which ranged from 53.5% to 59.9% in the period from 2016 to 2020, and in 2020 was 58.6%, which directly impacts the effectiveness of BNS, as it contributes to the delay in diagnosis and initiation of treatment³. Considering the ideal collection period, which is between the 3rd and 5th day of the baby's life, the test can be performed at the maternity ward before hospital discharge or at the Primary Health Care (PHC) collection point in the area where the newborn's family resides¹.

METHOD

This is a descriptive, exploratory and quantitative study, developed with the professionals who make up the basic team of the FHS working in the BHUs of a municipality in the interior of the state of Paraná. The municipality is located in the northwest region of the state of Paraná, 425 km from the capital Curitiba. According to data from the Brazilian Institute of Geography and Statistics (IBGE) (2020), it is estimated that the municipality has approximately 98,888 thousand inhabitants, and a Municipal Human Development Index (MHDI) of 0.695 (IBGE, 2010). Currently Sarandi has 10 BHUs and 12 FHS teams.

However, studies have shown superficial knowledge on the subject, both by health professionals and parents. A survey carried out in Uberaba showed that of 122 professionals interviewed in Basic Health Units (BHUs) in the city, 71.3% had not received continuing education on BNS, which reflected in the fact that during the survey, some professionals did not correctly state which diseases are detected by the test, with 20.3% of them mentioning Down Syndrome as one of them⁴.

Within the scope of the Unified Health System (*Sistema Único de Saúde* [SUS]), the Family Health Strategy (FHS) teams play an important role in BNS, which ranges from providing guidance and clarification to families about the exam, to carrying out the test, evaluating the result and child follow-up⁴.

Therefore, it is necessary that the members of the FHS teams are properly trained on the subject, in order to increase the population's access to BNS in a timely manner, allowing an early diagnosis and treatment, avoiding sequelae and providing a better quality of life for children with carriers of the diseases screened. In this context, the present study aims to evaluate the knowledge of Family Health Strategy professionals about the importance of BNS.

The study population consisted of 72 professionals out of the 89 in the municipality and 69 professionals working in the FHS who agreed to participate in the research, being 13 nurses (18.8%), 9 nursing technicians (13%), 4 physicians (5.8%) and 43 Community Health Agents (CHA) (62.3%). The exclusion criteria were: professionals on leave, on vacation, on maternity leave and on sick leave during the data collection period and those who are not part of the FHS in the municipality of Sarandi.

Data collection was carried out in May and June 2022, through a questionnaire developed by the author, structured with 25

essay questions, available to the professional in digital (Google Forms) or printed media. Two collection methods were used because some participants have difficulty with digital media and consequently with filling out the online form in addition to low adherence to participation.

The data obtained was arranged and stored in the Microsoft Office Excel program and later an analysis of the absolute and re-

lative frequency was carried out.

All participants signed the Free and Informed Consent Form (FICF). The research complied with all ethical precepts regulated by resolution 466/2012, which deals with research with human beings, and was approved by the Permanent Committee on Ethics in Research Involving Human Beings of the Ingá University Center (CEP-INGÁ), according to technical opinion No. 5.306.269.

RESULTS

69 professionals working at the FHS participated in the survey. Of these, 43 were Community Health Agents (62.3%), 13 nurses (18.8%), 9 nursing technicians (13%) and 4 physicians (5.8%). Female professionals prevailed (89.9%), aged between 30 and 39 years (38%) and with complete secondary education (42%). The time of professionals working in primary care (47.7%) and in the FHS (54.0%) ranged from 1 to 4 years for most professionals, as shown in Table 1.

Regarding the knowledge of professionals about the heel prick test, 56.5% reported that they do not know which diseases the test identifies. Of those who were able to identify at least one of the diseases, the most cited were sickle cell anemia and other hemoglobinopathies (33.3%) and congenital hypothyroidism (33.3%). When asked about the ideal period for collecting the test, 40.6% of the professionals correctly answered that the ideal period is from the 3rd to the 5th day of the newborn's life. However, 29% chose the period of less than 48 hours of life as the answer, and still 18.8% did not know how to answer, as shown in table 2.

In table 3, it is possible to observe that 89.9% of the professionals reported that the heel prick test is performed in their BHU, however, only 33.3% feel capable of guiding the family about the heel prick test, and the minority (21.7%) reported having already taken some training on the subject. A total of 34 (49.3%) of the professionals reported that they advise parents about the heel prick test, the majority being nurses 11 (84.6%) and doctors 3 (75%). Of these, 39 (56.5%) advise parents on how to obtain the result of the heel prick test.

After the child's birth, only 35 (50.7%) of the professionals check whether the test was performed, and it is observed that 28 (40.6%) of the professionals do not know how to obtain the result. Regarding the ideal period for guidance on the test, according to the opinion of each professional, 45 (65.2%) answered that it would be during pregnancy, 15 (21.7%) in the maternity, 3 (4.3%) at the time of collection and only 1 (1.4%) mentioned that it would be after the child's birth, according to data shown in Table 3.

Table 1 - Sociodemographic characterization and professional performance of Family Health Strategy professionals in the city of Sarandi, Paraná, 2022.

VARIABLES	No	%*
Professional category		
Nurse	13	18.8

to be continued...

... continuation table 01

VARIABLES	No	%*
Community Health Agent	43	62.3
Nursing technician	9	13.0
Doctor	4	5.8
Sex		
Female	62	89.9
Male	7	10.1
Age		
20 to 29 years old	11	17.5
30 to 39 years old	24	38.0
40 to 49 years old	17	27.0
≥ 50 years old	11	17.5
Education		
Complete high school	29	42.0
Technical course	14	20.3
Incomplete higher education	1	1.4
Complete higher education	10	14.5
Post-graduation (specialization level)	12	17.4
Masters	3	4.3
Time working in Primary Care		
< 1 year	16	24.7
1 to 4 years	31	47.7
5 to 9 years	7	10.8
10 to 15 years	9	13.9
> 15 years	2	3.1
Time working in the FHS		
< 1 year	5	13.5
1 to 4 years	20	54.0
5 to 9 years	6	16.2
10 to 15 years	6	16.2
> 15 years	0	-

*%: in relation to the total responses in each variable.

Note: the differences in the total of some variables can be justified by the absence of answers.

Table 2 - Knowledge of professionals from the Family Health Strategy team about the importance of the heel prick test, Sarandi, Paraná, 2022.

VARIABLES	No	%*
Knowing which diseases the heel prick test detects		
Yes	30	43.5
No	39	56.5
Diseases cited by professionals, which are detected by the heel prick test		
Sickle cell anemia and other hemoglobinopathies	23	33.3
Phenylketonuria	15	21.8

to be continued...

... continuation table 02

VARIABLES	No	%*
Congenital hypothyroidism	23	33.3
Cystic fibrosis	22	32.0
Congenital adrenal hyperplasia	13	19.0
Biotinidase deficiency	8	12.0
Ideal period for collection of the heel prick test		
Before 48 hours of life	20	29.0
Between the 3 rd and 5 th day of life	28	40.6
Between birth and the 7 th day of life	8	11.6
Didn't know how to answer	13	18.8

*%: in relation to the total responses in each variable.

Note: the differences in the total of some variables can be justified by the absence of answers.

Table 3 - Attitudes of professionals from the Family Health Strategy team regarding the heel prick test, Sarandi, Paraná, 2022.

Variables	Nurse	Doctor	Nursing technical	CHS	Total
In the BHU where you work, is the heel prick test collected?					
Yes	13 (100%)	3 (75%)	9 (100%)	37 (86%)	62 (89.9%)
No	0	1	0	4	5 (7.2%)
I don't know	0	0	0	2	2 (4.6%)
Do you feel qualified to advise parents about the heel prick test?					
Yes	10 (76.9%)	2 (50%)	4 (44.4%)	7 (16.3%)	23 (33.3%)
No	3 (23.1%)	2 (50%)	5 (55.5%)	36 (83.7%)	46 (66.7%)
Have you received any training on the heel prick test?					
Yes	7 (53.8%)	0	3 (33.3%)	5 (11.6%)	15 (21.7%)
No	6 (46.1%)	4 (100%)	6 (66.6%)	38 (88.4%)	54 (78.3%)
Do you advise parents about the heel prick test?					
Yes	11 (84.6%)	3 (75%)	4 (44.4%)	16 (37.2%)	34 (49.3%)
No	2 (15.4%)	1 (25%)	5 (55.5%)	27 (62.8%)	35 (50.7%)
If yes, what is the moment of advising?					
Prenatal	5 (38.5%)	1 (25%)	2 (22.2%)	2 (4.6%)	10 (14.5%)
Home visit	-	-	-	9 (20.9%)	9 (13.0%)
Childcare appointment	6 (46.1%)	2 (50%)	-	1 (2.3%)	9 (13.0%)
Pre-appointment	-	-	2 (22.2%)	-	2 (2.9%)
Puerperal consultation	-	-	-	2	
After the birth of the child, do you check if the heel prick test was performed?					

to be continued...

... continuation table 03

Variables	Nurse	Doctor	Nursing technical	CHS	Total
Yes	11 (84.6%)	4 (100%)	4 (44.4%)	16 (37.2%)	35 (50.7%)
No	2 (15.4%)	-	5 (55.5%)	27 (62.8%)	34 (49.3%)
Do you know how to get the heel prick test result?					
Yes	12 (92.3%)	4 (100%)	5 (55.5%)	20 (46.5%)	41 (59.4%)
No	1 (7.7%)	-	4 (44.4%)	23 (53.5%)	28 (40.6%)
If so, do you advise parents on how to get the result of the heel prick test?					
Yes	12 (92.3%)	3 (75%)	5 (55.5%)	19 (44.2%)	39 (56.5%)
No	-	1 (25%)	1 (11.1%)	9 (20.9%)	11 (15.9%)
Do you check the heel prick test result?					
Yes	11 (84.6%)	4 (100%)	4 (44.4%)	2 (4.6%)	21 (30.4%)
No	2 (15.4%)	-	5 (55.5%)	41 (95.3%)	48 (69.6%)
In your opinion, what is the ideal period to advise parents about the heel prick test?					
During pregnancy	9 (69.2%)	2 (50%)	4 (44.4%)	30 (69.8%)	45 (65.2%)
At the time of collection	-	-	1 (11.1%)	2 (4.6%)	3 (4.3%)
In maternity ward	4 (30.8%)	2 (50%)	4 (44.4%)	5 (11.6%)	15 (21.7%)
After the birth of the child, at the BHU	-	-	-	1 (2.3%)	1 (1.4%)

DISCUSSION

According to the norms of the National Neonatal Screening Program, the test needs to be collected between the 3rd and 5th day of life of the newborn, so that diseases that have some specificity such as Phenylketonuria and Congenital Hypothyroidism can be identified early^{5,6}. However, it was observed in the present study that less than 50% of professionals were able to state the ideal period for collecting the test. Corroborating this finding, a survey conducted in Três Lagoas- Mato Grosso do Sul, with 63 nursing professionals from Primary Health Care (PHC) units and described that nursing technicians (55.6%) and nurses (22.2%) do not know the ideal age for collecting the test⁷.

It was evident in the present study that most professionals reported not knowing which diseases the heel prick test detects. A study carried out in the interior of São Paulo, found a similar result, where 5 of the 21 interviewees mentioned diseases not identified by biological neonatal screening⁸, resembling another survey carried out in Diamantina - Minas Gerais, with 49 health professionals, where 85.71% (42) were unable to describe the six diseases screened by the test⁹.

It was identified that most of the participating professionals do not feel able to carry out the guidelines and report that they have never received training on the subject. A study carried out in 2020, through an inte-

grative review, described that five of the six studies with health professionals pointed out that nurses demonstrated a lack of knowledge about the heel prick test¹⁰.

In the present study, it was possible to observe that the category of community health agents (CHAs) is not properly trained, and little present in the guidelines on the test for families, which would certainly contribute to increasing the coverage of BNS, since in a study carried out with a team from the Family Health Strategy in Porto Alegre¹¹, these professionals are identified as being an important link between the population and the health services, playing the role of providing guidance on the unit and the flow of customer service, and collecting information about the population, more easily identifying their needs, mainly through home visits⁸.

Contradicting the findings of other studies⁸, that demonstrate the medical professional as being the most active in the guidance to parents about the heel prick test, we observed in the present research that the nurse was the professional who reported in greater proportion to carry out this guidance. In view of this, we cannot impose an obligation to provide guidance on the heel prick test to only one professional category; however, the performance of the multidisciplinary team in the process of implementing the BNS is of paramount importance.

With regard to delivering the results of

the heel prick test to the family, current research has shown that few professionals seek to verify the result obtained, most of these being CHAs, as a good part of them are not aware of the means to obtain it. This data contradicts the finding in a survey carried out in 2016 with 10 nurses from Mato Grosso, in which most of them report that they perform the delivery of the result, however, this happens through the ACS's, who are in charge of delivering the normal results, and nurses contact the family only in case of abnormal results.

The active search work is essential, as it is a means of capturing probable positive cases for the screened diseases, and allowing a faster and more effective identification of cases in which recall is necessary¹¹. So that the entire team can be prepared to carry out pre- and post-test guidance, as well as an adequate collection, it is necessary that professionals receive training, and that they participate with some regularity in events to update and improve techniques and theoretical knowledge, according to the demands of the new regulations and procedures that may arise.

The limitations of this study included the fact that the data obtained dealt with the professionals' perceptions of their own knowledge, therefore, they were not observed and evaluated by the researcher, which may result in results that differ from reality.

CONCLUSION

The knowledge and attitude of professionals from the Family Health Strategy Teams in relation to biological neonatal screening is superficial, and brings to light the importance of implementing new permanent education schemes, such as lectures and practical activities with the aim of professionals expand their knowledge and feel safe to perform the heel

prick test effectively.

Given the lack of studies on the subject, it is suggested that further research is carried out including other cities in Paraná, in order to obtain a more comprehensive and faithful parameter of the professionals' knowledge, since only one municipality cannot show the reality of an entire territory.

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