http://dx.doi.org/10.23925/2176-2724.2019v31i4p630-640

Evaluation of Children with Risk Indicators for Hearing Loss in a Newborn Hearing Screening Reference Service

Avaliação de Crianças com Indicadores de Risco para Deficiência Auditiva Atendidas em um Serviço de Referência em Triagem Auditiva Neonatal

Evaluación de Niños con Indicadores de Riesgo para Deficiencia auditiva Atendidas en un Servicio de Referencia en Triagem Auditiva Neonatal

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Abstract

Objective: To evaluate the hearing of children with risk indicators for hearing loss who underwent newborn hearing screening and returned to follow up after six months. **Methods:** Longitudinal study conducted at the Newborn Hearing Screening Service of a university hospital with children with risk

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Authors' Contributions:
ALFR: joined in all planning and in the study design, data gathering, making and producing the article; LMR: joined in the conception of the study, coordinated the work and participated in the review of the article; EAAC: joined in discussions and article review; PA: joined in the conception of the study, discussions, writing and review of the article; SASC: joined in the conception of the study, guided all stages of the work and participated in the writing and review of the article.

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Received: 22/11/2018
Accepted:17/12/2019

indicators for hearing loss. The study was performed in two stages: test and retest (when necessary) and follow-up (at six months). **Results:** 179 children were evaluated in the screening. In this stage there was an association between "failed" result in both ears and suspected syndrome and "failed" result and cytomegalovirus. In all the stages, 12 children presented conductive alterations confirmed by the immittanciometry and none presented sensorineural alteration. **Conclusion:** Conductive hearing loss was more present in this population. No sensorineural hearing loss was detected in any child evaluated during the study period; therefore the auditory monitoring of these children should be performed until later ages to detect any progressive or late-onset hearing loss.

Keywords: Newborn Screening; Hearing; Hearing Loss; Infant; Risk Index

Resumo

Objetivo: Avaliar a audição de crianças com indicadores de risco para deficiência auditiva que realizaram triagem auditiva neonatal e retornaram para o acompanhamento após seis meses. **Métodos:** Estudo longitudinal realizado no Serviço de Referência em Triagem Auditiva Neonatal de um hospital universitário com crianças com indicadores de risco para deficiência auditiva. O estudo foi realizado em duas etapas: teste e reteste (quando necessário) e acompanhamento (aos seis meses de idade corrigida). **Resultado:** Na triagem foram avaliadas 179 crianças. Nesta etapa houve associação entre resultado "falha" em ambas as orelhas e suspeita de síndrome e resultado "falha" e citomegalovirose. Em todas as etapas 12 crianças apresentaram alterações condutivas confirmadas pela imitanciometria, e nenhuma apresentou alteração neurossensorial. **Conclusão:** A alteração auditiva condutiva foi a mais presente nesta população. Não foram detectadas alterações auditivas neurossensoriais em nenhuma criança avaliada no período do estudo, portanto o monitoramento auditivo dessas crianças deve ser realizado até idades mais avançadas para se detectar eventuais perdas auditivas progressivas ou de origem tardia.

Palavras-chave: Triagem Neonatal; Audição; Perda Auditiva; Lactente; Indicador de Risco

Resumen

Objetivo: Evaluarlaaudición de niñoscon indicadores de riesgo para ladeficiencia auditiva que realizaronlatamizaje auditivo neonatal y regresaron para elseguimientodespués de seis meses. **Métodos:**Estudio longitudinal realizado enelServicio de ReferenciaenTriage Auditiva Neonatal de un hospital universitarioconniñoscon indicadores de riesgo para ladeficiencia auditiva. El estudiofue realizado endos etapas: prueba y reprueba (cuandonecesario) y seguimiento (a los seis meses de edad corregida). **Resultado:**Enlaselección se evaluaron 179 niños. En esta etapa huboasociación entre resultado "falla" en ambas orejas y sospechosa de síndrome y resultado "falla" y citomegalovirosa. En todas las etapas, 12 niñospresentaronalteracionesconductivas confirmadas por laimitanciometría y ningunapresentóalteraciónneurosensorial. **Conclusión:** La alteración auditiva conductivafuela más presente en esta población. No se detectaronalteraciones auditivas neurosensorialenningúnniñoevaluadoenel período delestudio, por lo que elmonitoreo auditivo de estosniñosdebe ser realizado hasta edades más avanzadaspara detectar eventualespérdidas auditivas progresivas o de origentardío.

Palabras claves: Tamizaje Neonatal; Audición; Pérdida Auditiva; Lactante; Índice de Riesgo

Introduction

The hearing is directly related to the general development of the child. Therefore if there is any hearing alteration, the cognitive, academic, social and speech-language abilities will be affected[1]. To prevent that such abilities get impaired, it is extremely important that hearing alterations be detected on time.

Along with this objective, the law 12.3030 from 2010 made obligatory the Hearing screening by the Otoacoustic Emissions in Brazil[2]. This method is executed thoroughly during the Neonatal hearing Screening (NHS) and evaluates the cochlear integrity. Beside the Otoacoustic Emissions, Brainstem Auditory Evoked Potential (ABR) and Hearing Performance Evaluation are also performed on children with Risk Indicators for Hearing Loss (RIHL) and as Auditory Behaviour Evaluation[3].

The incidence of hearing loss on children with RIHL can reach 8,3%[4],with onset of impairment either being able to exhibit at birth or later during the first months of life[5].

The hearing loss can be identified outside of a NHS context when the beginning of this hearing loss occurs on the post-natal stage, when there is a congenital hearing loss that was missed bypassed through a NHS, and when a NHS wasn't performed[6].

To detect the losses that occurred on the post-natal stage and the congenital hearing losses, the hearing and speech monitoring is extremely important[5-7].

The Joint Committee of Infant Hearing (JCIH) recommends that children with RIHL perform the monitoring until three years old[7], however an English study verified that 25% of children older than four years old that passed on the NHS showed hearing alterations, and some of these alterations occurred after the age of three years old[8].

In Brazil, the Ministry of Health guidelines recommend that these children be monitored until twelve months old at Basic Health Units[9]. In 2007, the State Secretary of Minas Gerais instituted the State Program for Neonatal Auditory Screening that advocates the execution of a retest if the child doesn't pass at the screening, and a follow-up performed only six months after the screening[10].

The objective of this study was to describe the results of the hearing evaluation in the follow-up stage on children with risk indicators for hearing loss.

Methods

This study was approved by the Comitê de Ética em Pesquisa (COEP) from UFMG (approval number: 934.475).

It is about a longitudinal study performed in a Reference Service in Neonatal Auditory Screening.

There were selected for this research 179 children with risk indicators for hearing loss that were born at the hospital around March, 2015 and March, 2016. RIHL considered were: family background for hearing loss; congenital infection, syndromes associated to hearing loss; neurodegenerative disorders; presence of craniofacial malformations; birth weight lower than 1500g; presence of periventricular haemorrhages; hyperbilirubinemia with exsanguinous transfusion; usage of ototoxic medications; usage of mechanical ventilation; ICU stay longer than 48 hours; bacterial meningitis; stigma or another finding associated to a syndrome that includes sensorineural hearing loss; concern of the caretaker in regard to the hearing, speech, language or developmental delays; postnatal infections; head trauma; chemotherapy; prematurity[7,11-13].

At the screening (first segment), Transient Otoacoustic Emissions (TOAE), Automatic Brainstem Auditory Evoked Potential (A-ABR) and cochleopalpebral reflex (CPR) were performed. The criteria for a "passed" result were TOAE presence, replication of the V-wave at 40 dBHL on the A-ABR and presence of CPR. In case of a "failed" result, the children were forwarded to the retest (second segment) after a month and the same procedures were performed.

In case of same result, Distortion Product Evoked Otoacoustic Emissions (DPOAE) and high frequency immitanciometry would be performed to get more details of the hearing loss. In case of middle ear alterations, the children were forwarded to otorhinolaryngological evaluation and revaluated afterwards.

Six months after the screening, the children who passed on the screening or retest were submitted for follow-up (third segment) to monitor the auditory development and detect possible progressive or late losses. At this stage, there were performed TOAE, A-ABR and CPR. Whenever the children presented TOAE absence, Distortion

Product Evoked Otoacoustic Emissions and high frequency immitanciometry were performed. In case of middle ear changes, the children were forwarded to otorhinolaryngological evaluation and revaluated afterwards.

The equipment used for the TOAE, DPOAE and A-ABR was *Elios*®, by ECHODIA. This is a multifunction and portable device for computerised functional tests.

The adopted TOAE log record used non-linear clicks stimuli at an 80 dBSPL intensity. The TOAE were considered present when the reproducibility was higher or equal to 70% and the S/N (signal-to-noise) ratio higher or equal to 3dB.

To perform the A-ABR it was used an equipment by ECHODIA with in-ear phones and two 40 dBHL scans, automatic protocol of the equipment.

The cochleopalpebral reflex was performed through an agogo (large bell jar) with 100 dBSPL intensity.

The DPOAE were also performed through ECHODIA using two pure tones (F1 and F2) with a 1,22 frequency ratio and standard intensity of 60/60 dBSPL (L1 and L2) at 2, 3, 4 and 5 kHz frequencies.

The Immitanciometry test used the *interacoustics* At235h equipment at a 1000 Hz frequency, as recommended for the age group[14], tuned according to ANSI S3.6 standard.

The follow-up scheduling was made at the test or retest and two contacts were made with the child's parent(s)/guardian(s), one on the previous week of the evaluation and the other a day before it.

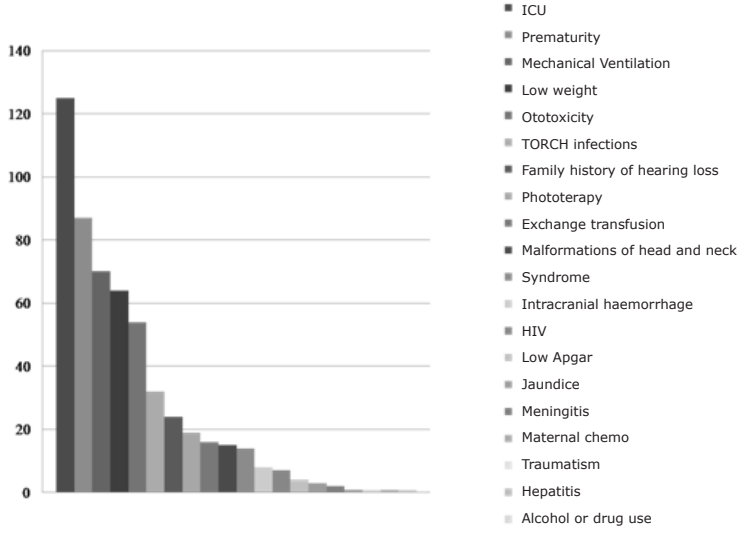
The statistical analysis was performed through the *Statistical Package for Social Sciences* (SPSS) program, 20.0 version. The inferential statistical analysis was performed through Chi-squared testing or Fisher's Exact test for association among the categorical variables.

It was adopted a significance level of 5% ($p \leq 0,05$). Findings at a 10% significance level ($p \leq 0,10$) were considered a tendency to statistical significance.

Results

Through the period of March, 2015 and March, 2016, 179 children were evaluated being 103 male and 76 female. The average age of the first evaluation was of 63 days old.

The most common risk indicator for hearing loss was an ICU stay longer than 48 hours (69,8%), followed by prematurity (49%) and mechanical ventilation (39%) as shown on Figure 1.



Legend: ICU – Intensive Care Unit
TORCH – Toxoplasmosis, Rubella, Cytomegalovirus, Herpes or Syphilis
HIV- Human Immunodeficiency Viruses

Figure 1. Risk indicators for hearing loss in the neonatal hearing screening

Out of the 179 evaluated children, 47 (26,3%) "failed" (26 male and 21 female), 28 in both ears, 10 in only the right ear and 8 in only the left ear.

In the screening, there was an association between "fail" and presence or suspicion of syndrome and presence of Cytomegalovirus infection, as shown in Table 1.

Table 1. Association between risk indicators and neonatal hearing screening result

Indicators		Screening		P-value	Odds Ratio	CI 95%
		Failed N (%)	Passed N (%)			
Prematurity						
	No	26 (28,3)	66 (71,7)	0,420	1,320	0,672 – 2,591
	Yes	20 (23)	67 (77)			
Low Weight						
	No	31 (27)	84 (73)	0,606	1,206	0,593 – 2,452
	Yes	15 (23,4)	49 (76,6)			
ICU						
	No	18 (33,3)	36 (66,7)	0,124	1,732	0,856 – 3,505
	Yes	28 (22,4)	97 (77,6)			
Transfusion						
	No	43 (26,4)	120 (73,6)	0,765	1,553	0,422 – 5,714
	Sim	3 (18,8)	13 (81,2)			
History						
	No	37 (23,9)	118 (76,1)	0,155	0,523	0,211 – 1,292
	Yes	9 (37,5)	15 (62,5)			
Phototherapy						
	No	42 (26,2)	118 (73,8)	0,784	1,335	0,419 – 4,248
	Yes	4 (21,1)	15 (78,9)			
Ototoxic Drugs						
	No	29 (23,2)	96 (76,8)	0,245	0,657	0,324 – 1,336
	Yes	17 (31,5)	37 (68,5)			
Mechanical Ventilation						
	No	32 (29,4)	77 (70,6)	0,162	1,662	0,812 – 3,402
	Yes	14 (20)	56 (80)			
Meningitis						
	No	46 (26)	131 (74)	1,000	0,740	0,678 – 0,808
	Yes	0 (0)	2 (100)			
Intracranial Haemorrhage						
	No	44 (25,7)	127 (74,3)	1,000	1,039	0,202 – 5,340
	Yes	2 (25)	6 (75)			
Malformation						
	Noo	43 (26,2)	121 (73,8)	0,763	1,421	0,383 – 5,280
	Yes	3 (20)	12 (80)			
Toxoplasmosis						
	No	42 (25,3)	124 (74,7)	0,743	0,762	0,223 – 2,604
	Yes	4 (30,8)	9 (69,2)			
HIV						
	No	45 (26,2)	127 (73,8)	0,679	2,126	0,249 – 18,15
	Yes	1 (14,3)	6 (85,7)			
Maternal Chemo						
	No	45 (25,4)	132 (74,6)	0,258	0,254	0,198 – 0,327
	Yes	1 (100)	0 (0)			

Indicators		Screening		P-value	Odds Ratio	CI 95%
		Failed N (%)	Passed N (%)			
Syphilis						
	No	41 (24,7)	125 (75,3)	0,274	0,525	0,163 – 1,694
	Yes	5 (38,5)	8 (61,5)			
Syndrome						
	No	39 (23,6)	126 (76,4)	**0,030***	0,310	0,102 – 0,937
	Yes	7 (50)	7 (50)			
Rubella						
	No	46 (26,1)	130 (73,9)	0,570	0,739	0,676 – 0,806
	Yes	0 (0)	3 (100)			
CMV						
	No	43 (24,4)	133 (75,6)	**0,016***	0,244	0,188 – 0,317
	Yes	3 (100)	0 (0)			
Jaundice						
	No	46 (26,1)	130 (73,9)	0,570	0,739	0,676 – 0,806
	Yes	0 (0)	3 (100)			
Traumatism						
	No	46 (25,8)	132 (74,2)	1,000	0,742	0,680 – 0,809
	Sim	0 (0)	1 (100)			
Hepatitis						
	No	46 (25,8)	132 (74,2)	1,000	0,742	0,680 – 0,809
	Sim	0 (0)	1 (100)			
Low Apgar						
	No	46 (26,3)	129 (73,7)	0,574	0,737	0,675 – 0,805
	Sim	0 (0)	4 (100)			
Alcohol / Drugs						
	No	46 (25,8)	132 (74,2)	1,000	0,742	0,680 – 0,809
	Yes	0 (0)	1 (100)			

Chi-squared testing or Fisher's Exact test (p≤0,05)
* = p<0,05
Legend:ICU- Intensive Care Unit
CMV- Cytomegalovirus
HIV- Human Immunodeficiency Virus

In the retest, out of the 47 scheduled children, only 22 (46,8%) attended. Out of these, two (9%) "failed" due to middle ear changes and it wasn't found any sensorineural hearing alterations afterwards.

Out of the six children with confirmed or suspicion of syndrome that failed in the screening, only one performed a retest, obtaining a "pass" result.

There was a statistically significant difference in the RIHL low weight and "failed" result in the retest, as shown in Table 2.

Table 2. Comparison between risk indicators for hearing loss and result in the retest

		Retest Result		P-value	Odds Ratio	CI 95%
		Failed N (%)	Passed N (%)			
Prematurity						
	No	0 (0)	13 (100)	0,055	1,500	0,945 – 2,381
	Yes	3 (33,3)	16 (66,7)			
Low Weight						
	No	0 (0)	15 (100)	**0,023***	1,750	0,921 – 3,324
	Yes	3 (42,9)	4 (57,1)			
ICU						
	No	0 (0)	9 (100)	0,240	1,300	0,965 – 1,751
	Yes	3 (23,1)	10 (76,9)			
Transfusion						
	No	2 (9,5)	19 (90,5)	0,136	0,095	0,025 – 0,356
	Yes	1 (100)	0 (0)			
History						
	No	3 (17,6)	14 (82,4)	1,000	0,824	0,661 – 1,026
	Yes	0 (0)	5 (100)			
Phototherapy						
	No	2 (11,1)	16 (88,9)	0,470	0,375	0,025 – 5,572
	Yes	1 (25)	3 (75)			
Ototoxicity						
	No	2 (12,5)	14 (87,5)	1,000	0,714	0,053 – 9,700
	Yes	1 (16,7)	5 (83,3)			
MV						
	No	2 (13,3)	13 (86,7)	1,000	0,923	0,069 – 12,28
	Yes	1 (14,3)	6 (85,7)			
IH						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			
Malformation						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			
Toxoplasmosis						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			
HIV						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			
Maternal Chemo						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			
Syphilis						
	No	3 (15)	17 (85)	1,000	0,850	0,707 – 1,022
	Sim	0 (0)	2 (100)			
Syndrome						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			
CMV						
	No	3 (14,3)	18 (85,7)	1,000	0,857	0,720 – 1,021
	Yes	0 (0)	1 (100)			

Chi-squared testing or Fisher's Exact test (p≤0,05)
* = p<0,05
Legend: ICU- Intensive Care Unit
MV- Mechanical Ventilation
CMV- Cytomegalovirus
IH- Intraventricular Haemorrhage
HIV- Human Immunodeficiency Virus

During the study period, the 132 children that passed the screening and the 22 that passed the retest were forwarded to follow-up, totalling 154 children. Only 81 (52,6%) attended the evaluation. Out of these, 51 (63%) were male and 30 (37%) female, according to Figure 2.

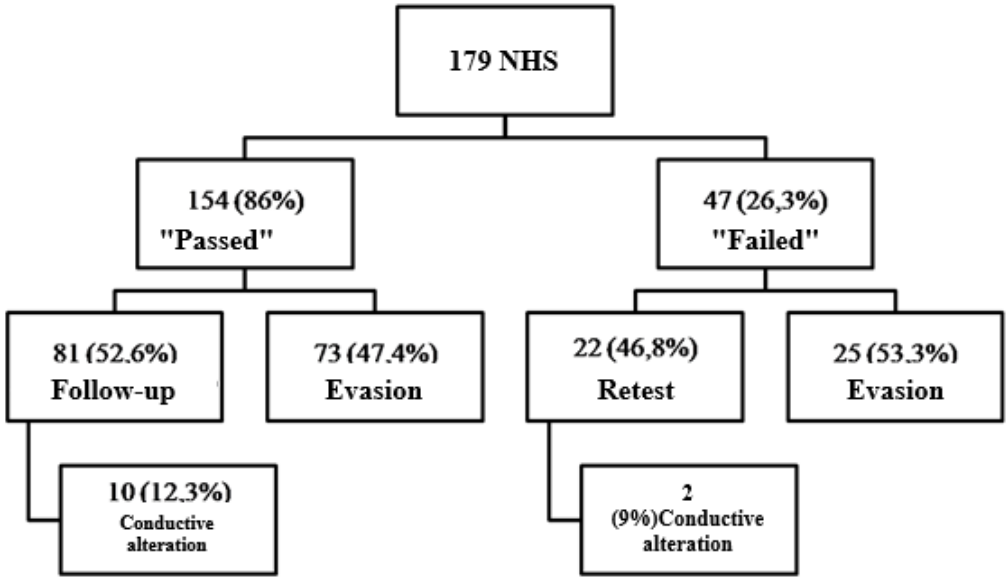


Figure 2. Neonatal hearing screening care fluxogram

Out of the 81 evaluated children, ten (12,3%) showed middle ear changes and two didn't get a conclusive result because they were wheezing, already on medical treatment for respiratory alterations during the execution of the procedures and didn't return for a new evaluation.

The ten children that showed middle ear alterations were forwarded to otorhinolaryngological evaluation. Out of the ten children, six were evaluated in winter and two in autumn. Among these, four came back for a new auditory evaluation and showed a "pass" result on the evaluation.

The other two children that got an inconclusive result didn't return for a new evaluation.

There was statistical significance between the number of risk indicators for hearing loss and evasion in the follow-up, as shown in Table 3.

Table 3. Association between risk indicators for hearing loss and evasion in follow-up

		Follow-up		P-value	Odds Ratio	CI 95%
		Didn't attend N (%)	Attended N (%)			
Number of RIHL						
	1 – 4	65 (51,2)	62 (48,8)	**0,030***	2,621	1,076 – 6,387
	5 – 8	8 (28,6)	20 (71,4)			

Chi-squared test (p≤0,05)
* = p<0,05
RIHL – Risk Indicators for Hearing Loss

Discussion

The literature shows that the NHS should be executed until one month of age[2,3,7,10], but the average age of the patients examined by NHS in this study was 63 days old, which is not in accordance with what is advocated by the literature. However it is worth noting that this population, coming from an intensive care unit, often don't have hospital discharge before the first month of life, what could be used as an excuse for the execution of NHS a little later.

An ICU stay of more than 48 hours was the most common RIHL found in national studies[4,11], just as in the present study. It is worth noting that the study site is a reference service for risk gestation, which can contribute to the high rate of enrolment of children that require intensive care.

The rate of the "pass" result in the screening was of 73,7%, a value similar to a study performed in the same institution in which the rate was of 71,3%[15]and in another national institution in which the rate was of 74,7%[11]. Upon work done with low and high risk children it was verified that the "pass" rate at this stage was of 91,24% and 65,85%, respectively[16].

The Joint Committee on Infant Hearing recommends that the "fail" rate in the screening doesn't surpass 10%[7]but it doesn't mention this rate for children with RIHL. In this study, 26,3% of the children "failed", a rate similar to that of a study performed on children with and without RIHL in which the rate was of 25,3%[11]. In the retest, the "fail" rate was of 9%, all of which due to conduction alterations.

There was statistically significant correlation between the "fail" result in the retest and the low weight RIHL. Some studies verified this correlation in the screening[17,18]. It is believed that this occurs due to numerous risk factors associated with low weight like asphyxia, mechanical ventilation, usage of ototoxic medicaments and infections[19].

None of the children evaluated in the follow-up presented sensorineural alterations. The SES-MG protocol determines that the follow-up must be done at six months of age[10], however the sensorineural alterations of progressive or late origin may not be diagnosed in this short period of time. The Ministry of Health (MH), through UNHS's guidelines, recommends that the monitoring of hearing and language development should be executed during routine appointments at the Basic Health Unit (BHU) until 12 months old[9]. The Joint Committee on Infant Hearing argues that such follow-up should be executed until three years old[10] and another international study verified that some children showed some hearing alterations after three years old[8].

Out of the 81 evaluated children in follow-up, ten (12%) showed conductive impairment. Out of the ten children, six were evaluated in winter and two in autumn. A Brazilian study showed that a third of the infants under one year old presented effusion of the middle ear associated with the seasons (autumn and winter), in addition to other common factors of the population tested in this study, such as artificial feeding, Apgar score under 7 and the fact that the child attended a day care center[20].

When evaluating 1300 Australian children from 6 to 30 months old of rural communities, a study found that only 10% showed aerated middle ear, 42% otitis media with effusion, 30% acute otitis media and 15% chronic secretory otitis media[21].Another study performed in India verified that acute and chronic suppurative otitis media are significantly more common in urban slums, in comparison to urban areas without slums or rural vicinities[22]. The Hospital in which this study was made belongs to the SUS network and care for users from the entire state of MInas Gerais, in its majority low income people, from urban areas including slums and rural vicinities.

A study performed in the United States suggests the auditory deprivation harms efferent and afferent innervations of hair cells, in a similar manner to that observed in hearing loss related to age and induced by noise, therefore these effects must be considered in the treatment of chronic conductive hearing loss in the clinic[23].

The UNHS protocol expect the immitanciometry execution only at the stage of diagnosis[3,7], but taking into account the occurrence of conductive alterations in this population evaluations like immitanciometry could be part of UNHS protocol, mainly in the follow-up segment, since the peak incidence of otitis is between six and eleven months old and the appearing of the first episode in age group can infer to recurring otitis media in the future[24].

The multidisciplinary Committee in hearing health recommends that the evasion rate should be inferior to 10%[3]. In an integrative review na-

tional survey, it was verified that this rate varied from 2,8% to 100%[24]. In this study, 47,4% of the scheduled children didn't attend to follow-up. In a retrospective study performed by the same institution, this rate was of 61,74%[4]. Therefore, the actions performed in order to decrease evasion like scheduling confirmation a week prior to the evaluation could have reduced the rate, but the result isn't satisfactory yet.

Other researches also showed evasion as a great obstacle for the for UNHS's services efficiency. This obstacle could have underestimated the occurrence of hearing loss in the studied population, mainly in children with syndrome suspicion, once that most of the kids "failed" in the first evaluation didn't attend for retest and that the occurrence of hearing loss in children with this RIHL is 18 times superior than in children without suspicions[4].

In this study, it was verified that an elevated number of risk indicators for hearing loss contributed for the presence of children in the follow-up. The concern of the parent(s)/guardian(s) for the possible after-effects caused by the children's health framework is a factor that might have contributed for the decrease of evasion of children with five or more RIHL. In the study performed, it was verified that the presence at the screenings is also related with the health conditions of the newborn (less weight, long periods of hospitalization in an ICU and higher amount of RIHL)[26].

The Family Health Support Center (NASF) can be a great ally for the hearing screening service, once that it has the objective of expanding the actions on basic care and supporting strategies insertions in the families healthcare in services network[27].

The implementation of Basic Health Units for Neonatal Hearing Screening is a valid strategy in the attempt to reduce evasion, once the family wouldn't need to bear the costs of transport and the community health agents (CHA) could multiply the knowledge around the importance of the execution of UNHS and reminding of the scheduled dates for evaluation.

Conclusion

The conductive hearing alterations were more frequent in the studied population. No children were diagnosed with sensorineural hearing loss at six months old and the small sample could have interfered in this result. The follow-up at six months old was effective for the detection of conductive alterations, however it's worth noting the importance of auditory monitoring in older children in an attempt to properly diagnose progressive or late hearing losses in this population.

The high evasion rate may have underestimated the occurrence of sensorineural hearing loss in this population and is presented as the greatest obstacle for the Neonatal Hearing Screening service effectiveness.

Aknowledgments

CAPES (Capes/Cofecub, project n°861/15) and Technical support: Echodia, St. Beauzire, France

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