STANDARDIZATION OF THE AUDITORY BRAINSTEM RESPONSE IN NEWBORNS

Normatização do potencial evocado auditivo de tronco encefálico em recém-nascidos

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ABSTRACT

Purpose: to regulate the findings of ABR equipment of the institution Audiology Clinic of St. Luke School, in newborns. **Methods:** this is a cross-sectional study, exploratory non-experimental attended forty newborns without risk indicators for hearing loss, which passed the newborn hearing screening, divided according to age in weeks (G1, G2, G3 and G4). For data collection was used the equipment Smart EP-Intelligent Hearing Systems with click stimuli. **Results:** the mean values of absolute latencies of waves I, III and V in accordance with age are, respectively: G1=1,62ms, 4,39ms, 6,8ms; G2=1,62ms, 4,4ms, 6,79ms; G3=1,56ms, 4,39ms, 6,74ms; G4=1,54ms, 4,2ms, 6,53ms. In the same order, the mean values of the interpeak latencies I-III, III-V and I-V were: 2,77ms, 2,42ms e 5,19ms; 2,78ms, 2,39ms e 5,17ms; 2,83ms, 2,35ms e 5,18ms; 2,66ms, 2,33ms e 4,99ms. **Conclusion:** the absolute latencies decreased with increasing age having mean of the 1,58ms for wave I, 4,34ms for wave III and 6,71ms for wave V. Similarly, the mean interpeak I-III, III-V and I-V were lower in G4 medium and obtained in the first months of 2,76ms, 2,37ms and 5,13ms.

KEYWORDS: Hearing; Electrophysiology; Infant, Newborn; Evoked Potentials, Auditory, Brain Stem

INTRODUCTION

The integrity of the auditory system, anatomic and physiologically, is considered a prerequisite to normal acquisition and development of speech and language. Therefore, a child must be capable to pay attention, detect, distinguish and locate sounds. The auditory system also actuates on memory and integration of hearing experiences. Everything to child achieves detection and comprehension of speech[1]. Thus, the hearing impaired child, if not early diagnosed, will have these abilities damaged[2].

The Newborn Hearing Screening (NHS) is the main instrument for hearing impairment detection in newborns[2] and should be developed in the firsts moments of the newborn's life enabling the early diagnose and the accurate intervention, in ways to optimize the development of speech and language of this child.

The American Academy of Pediatrics[3], the Joint Committee on Infant Hearing (JCIH)4 and the Multiprofessional Committee of Hearing Health (COMUSA)[5] preconize that every newborn must be evaluated by electrophysiological measures.

The electrophysiological exams are the most used to assess the auditory integrity because it does not depend on patient's cognitive response to the sonorous stimulus, that is, its application is objective[6]. On the NHS programs the Evoked Otoacoustic Emissions (OAE) and the Auditory Brainstem Response (ABR) are used. In case the NHS fails the newborn should be submitted to the diagnostic stage in which one of the procedures is the ABR diagnostic.

The ABR is an exam that aims to obtain the register of the electric activity occurring in the auditory system to the brainstem, besides to be used to research the electrophysiological threshold

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and evaluates the maturation of the central auditory pathway in newborns[7].

The maturation of the auditory pathway is complete around 18[8,9] or 24[2] months of age, and this becomes a variable to analysis of results obtained on ABR, since it has direct influence over values of absolute and interpeaks latencies. Therefore, it is necessary to obtain normative data, considering, besides age, other variables as: gender, the equipment used and the stimulus given[10].

Standard patterns are also less studied under weak intensities (30 dB HL), being necessary a standardization under these intensities. Thus, with the normative data will be possible an early diagnose and posterior intervention, that is essential in the firsts moths of age, since the hearing impairment can restrict severely the capacity of oral language development and further deficit on the global development and life quality[2].

There are studies have already been published that bring normative data to ABR, although, it is necessary to take into account if the patterns of stimulus given and the subject tested are the same as in the study used as reference. Due to many studies do not specify details about the patterns, the data to be used in the interpretation of the ABR outcomes should be obtained from the normative study on the laboratory[11], which justifies the importance of this research, revealing accurate data to an early diagnose.

So, the present study aimed to standard the outcomes in newborns of the ABR equipment using the click stimulus under 80 and 30 dB HL at the Speech-language Pathology and Audiology Clinic of São Lucas University – FSL.

METHODS

It is a cross sectional study, exploratory, non-experimental. First it was sent a presentation letter and authorization application to the coordination of the Speech-Language Pathology and Audiology Clinic at the institution where the exams were developed. Also were sent presentation letters and authorization applications to the Hospital Dr. Ary Pinheiro, reference in the state of Rondônia and to the Clinic Limiar, responsible for the NHS program funded by the Health System and developed in the referred hospital and clinic. Therefore, the newborns of the sample were prevenient from the maternity of the hospital Dr. Ary Pinheiro and from the Clinic Limiar.

To accomplish the sample calculus was based on 250 newborns according to the average of newborns screened on both places above mentioned, during a 1-month period, when was developed the data collection. It was adopted a 12% level of error and confidence level of 90%, achieving to a sample number of 40 newborns. The number of newborns was divided into groups according to the age in weeks.

The inclusion criteria to compose the sample were: newborns that were on the first month, that do not presented risks indicators according to JCIH4, passed on ABR using Otoacoustic emissions and presented good reproducibility in the ABR tracing.

From the 40 newborns that participated on study, 20 were boys and 20 were girls. They were divided into four groups of 10 newborns, being five girls and five boys in each group, named according to age, as to: G1 (1st week of life), G2 (2nd week of life), G3 (3rd week of life) and G4 (4th week of life).

The approach on newborns' parents and responsible was established during the ABR. At this moment, it was explained the aim and methodology of the study, as well as it was developed an anamnesis focusing on investigate the risks indicators for hearing. The parents that agreed on the offspring's participation were conducted to the clinic in which was developed data collection.

All parents that attended to development of the exam were again elucidated about the aim of the study and the procedures to be developed. Those who agreed on the offspring's participation assigned a Consent Form.

The newborns were submitted to the ABR in the same week that they were submitted to the NHS.

The parents were instructed to carry the result of the NHS and in case of they did not accomplish, it was developed a retest using the Transient Otoacoustic Emissions and only participated those that obtained presence of it.

The exams were developed in room electrically treated with the equipment Smart EP – Intelligent Hearing Systems, version 2.40, attached to a computer.

The participants remained on mother's arms, in natural sleep. First the area was cleaned, using gauze and alcohol. After cleaning, it was fixed three disposable electrodes, which were: active electrode (positive), located on high front; reference electrode (negative), located on ipsilateral mastoid and neutral electrode, located on contralateral mastoid, because it was an equipment of one canal. The electrodes were connected to the equipment and the impedance was checked. It remained inferior to 3 Khoums in all exams developed. Finally, the ear phones were positioned in the external auditory conducts right and left.

For development of all exams it was used the click stimulus, rarefied polarity, speed of 27.7 stimuli

per second, registering a minimum number of 1000 stimuli.

First, the exam was developed under intensity of dB HL and after obtaining the tracing on waves I, III and V, they were identified and reported. Further, it was developed the research under intensity of 30 dB HL and reported waves that appeared (usually waves III and V). Such procedure was developed in both ears.

It was analyzed the values of absolute latencies on waves I, II and V and the interpeaks intervals I-III, III-V and I-V under 80 dB HL as well as the values of absolute latencies on waves III (when occur) and V under 30 dB HL in right and left ear and the interarual difference.

The average values of the absolute latencies on waves I, III and V under intensity of 80 dB HL and the absolute latencies on waves III and V under intensity 30 dB HL were calculated and it was made the evaluation of these values between the ears, among the different groups and inside groups according to gender. The average values of interpeak intervals also were calculated and compared according to the ear, as well as among the groups and inside the groups according to gender.

This study was approved by the Committee of Ethics on Research with Human Beings of São Lucas University under nº 590 /11.

The data were set out in an Excel sheet and submitted to the statistic tests Pared T-Student, ANOVA and Tukey Multiple Comparison Test., adopting significance level of 5%.

To the analysis of the values of absolute latencies under 80 dB HL and 30 dB HL it was considered the ears individually, so the sample was composed by 80 ears.

RESULTS

It was not found statistically significant difference when comparing the values of absolute latencies on waves I, III and V and of interpeak intervals under 80 dB HL (Table 1) as well as the absolute latencies III and V under 30 dB HL (p= 0.822 and p=0.419, respectively).

Under 80 dB HL intensity can be verified difference statistically significant in values of absolute latencies on waves I, III and V among the different groups (Table 2).

Table 1 – Evaluation of the absolute latencies and interpeaks values according to the tested ear under intensity of 80 dB Hearing Level

80 dB HL	Ear	Mean	Median	Standard Deviation	Min	Max	N	CI	p-value
I	RE	1.58	1.60	0.09	1.30	1.77	40	0.03	0.208
	LE	1.59	160	0.08	1.38	1.77	40	0.03	
III	RE	4.33	4.30	0.23	3.95	4.78	40	0.07	0.188
	LE	4.36	4.35	0.23	3.83	4.90	40	0.07	
V	RE	6.72	6.67	0.29	6.20	7.33	40	0.09	0.830
	LE	6.71	6.66	0.32	6.05	7.35	40	0.10	
I-III	RE	2.75	2.71	0.21	2.40	3.15	40	0.07	0.398
	LE	2.77	2.78	0.22	2.40	3.35	40	0.07	
III-V	RE	2.39	2.40	0.18	1.88	2.75	40	0.06	0.216
	LE	2.35	2.35	0.23	1.70	2.85	40	0.07	
I-V	RE	5.14	5.14	0.28	4.65	5.85	40	0.09	0.516
	LE	5.12	5.08	0.32	4.50	5.83	40	0.10	

*significant value (p<0.05) – Test T-Student paired
Caption: dB HL = decibels hearing levels; Min = minor value; Max = maximum value; N = sample number; CI = confidence interval; RE = right ear; LE = left ear

Table 2 – Absolute and interpeak latencies values under intensity 80 dB HL, according to the group

80 dB HL	Group	Mean	Median	Standard Deviation	Min	Max	N	CI	p-value
I	G1	1.62	1.60	0.10	1.38	1.77	20	0.05	0.01*
	G2	1.62	1.63	0.05	1.50	1.75	20	0.02	
	G3	1.56	1.57	0.08	1.38	1.68	20	0.03	
	G4	1.54	1.55	0.08	1.30	1.68	20	0.03	
III	G1	4.39	4.29	0.27	4.03	4.90	20	0.12	0.01*
	G2	4.40	4.39	0.21	4.03	4.88	20	0.09	
	G3	4.39	4.40	0.12	4.03	4.58	20	0.05	
	G4	4.20	4.17	0.23	3.83	4.80	20	0.10	
V	G1	6.80	6.75	0.31	6.33	7.22	20	0.13	0.02*
	G2	6.79	6.83	0.22	6.33	7.10	20	0.10	
	G3	6.74	6.66	0.31	6.15	7.35	20	0.14	
	G4	6.53	6.50	0.31	6.05	7.33	20	0.14	
I-III	G1	2.77	2.70	0.25	2.43	3.35	20	0.11	0.08
	G2	2.78	2.75	0.21	2.43	3.23	20	0.09	
	G3	2.83	2.84	0.14	2.58	3.10	20	0.06	
	G4	2.66	2.64	0.22	2.40	3.20	20	0.10	
III-V	G1	2.42	2.40	0.16	2.10	2.75	20	0.07	0.57
	G2	2.39	2.39	0.17	2.13	2.65	20	0.07	
	G3	2.35	2.35	0.29	1.70	2.85	20	0.13	
	G4	2.33	2.37	0.18	1.88	2.70	20	0.08	
I-V	G1	5.19	5.19	0.27	4.75	5.67	20	0.12	0.11
	G2	5.17	5.20	0.22	4.73	5.48	20	0.10	
	G3	5.18	5.08	0.35	4.55	5.85	20	0.15	
	G4	4.99	4.98	0.30	4.50	5.73	20	0.13	

*significant value ($p<0.05$) – Test ANOVA

Caption: dB HL = decibels hearing level; Min = minor value; Max = maximum value; N = sample number; CI = confidence interval; G1 = 1st week newborn, G2 = 2nd week newborn; G3 = 3rd week newborn; G4 = 4th week newborn

Confronting the groups outcomes in pairs using the Tukey Multiple Comparison Test, it was verified difference statistically significant between values of absolute latencies on waves I and V, under 80 dB HL of G4 when compared to the same values of G1 (p=0.025) and G2 (p=0.020), being the values in G4 inferior to those observed in these groups. However, the absolute latency on wave III, obtained in G4, presented difference when compared to values reported on other groups: G1 (p=0.040), G2 (p=0.025) e G3 (p=0.039), again being verified inferior values in G4. Regarding interpeak latencies I-III, III-V and I-V there were no difference statistically significant when comparing the outcomes of the four groups.

Referring to the values of absolutes latencies on waves III and V under 30 dB HL it was observed difference statistically significant among groups only for the absolute latency values on wave V (Table 3).

Table 3 – Absolute latency values under intensity 30 dB HL, according to the group

30 dB HL		Mean	Median	Standard Deviation	Min	Max	N	CI	p-value
III	G1	5.96	5.99	0.33	5.40	6.55	18	0.15	0.424
	G2	5.96	5.88	0.39	5.28	6.55	19	0.17	
	G3	5.90	5.88	0.21	5.58	6.22	17	0.10	
	G4	5.80	5.78	0.36	5.22	6.55	19	0.16	
V	G1	8.08	8.13	0.32	7.58	8.68	20	0.14	0.036*
	G2	8.10	8.02	0.41	7.42	8.78	20	0.18	
	G3	8.04	7.94	0.32	7.67	8.63	20	0.14	
	G4	7.80	7.83	0.37	7.15	8.65	20	0.16	

*significant value (p<0.05) – Test ANOVA

Caption: dB HL = decibels hearing level; Min = minor value; Max = maximum value; N = sample number; CI = confidence interval; G1 = 1st week newborn, G2 = 2nd week newborn; G3 = 3rd week newborn; G4 = 4th week newborn

It was observed difference statistically significant between outcomes of G2 and G4 (p= 0.049), in which G4 presented absolute latency value significantly inferior, when comparing the groups in pairs, using the Tukey Multiple Comparison Test.

The results to the averages of intraural difference in G1, G2, G3 and G4 were, respectively, 0.14 ms; 0.13 ms; 0.16 ms and 0.09 ms. It was conclude no difference statistically significant for those averages.

On the results obtained according to gender, it was found values significantly inferior in the feminine gender for absolute latencies on waves I and III in G2 and for the absolute latency on wave V in G4 (Table 4).

Table 4 – Evaluation of the absolute latencies as to the gender under intensity 80 dB HL

80 dB HL	Group	Gender	Mean	Median	Standard Deviation	Min	Max	N	CI	p-value
I	G1	Fem.	1.60	1.63	0.12	1.38	1.75	10	0.07	0.645
		Masc.	1.63	1.60	0.09	1.50	1.77	10	0.06	
	G2	Fem.	1.59	1.60	0.05	1.50	1.65	10	0.03	0.017*
		Masc.	1.65	1.65	0.05	1.57	1.75	10	0.03	
	G3	Fem.	1.54	1.56	0.05	1.45	1.60	10	0.03	0.271
		Masc.	1.58	1.60	0.10	1.38	1.68	10	0.06	
	G4	Fem.	1.54	1.55	0.10	1.30	1.68	10	0.06	0.788
		Masc.	1.55	1.55	0.06	1.43	1.63	10	0.04	
III	G1	Fem.	4.30	4.25	0.26	4.03	4.78	10	0.16	0.184
		Masc.	4.47	4.44	0.27	4.13	4.90	10	0.17	
	G2	Fem.	4.25	4.27	0.14	4.03	4.45	10	0.08	0.001*
		Masc.	4.54	4.53	0.18	4.35	4.88	10	0.11	
	G3	Fem.	4.38	4.39	0.15	4.03	4.58	10	0.09	0.856
		Masc.	4.39	4.43	0.08	4.25	4.47	10	0.05	
	G4	Fem.	4.12	4.14	0.10	3.95	4.25	10	0.06	0.127
		Masc.	4.28	4.24	0.30	3.83	4.80	10	0.18	
V	G1	Fem.	6.80	6.67	0.32	6.35	7.22	10	0.20	0.894
		Masc.	6.81	6.83	0.30	6.33	7.22	10	0.19	
	G2	Fem.	6.69	6.79	0.21	6.33	6.92	10	0.13	0.062
		Masc.	6.88	6.94	0.20	6.53	7.10	10	0.12	
	G3	Fem.	6.78	6.64	0.31	6.53	7.35	10	0.19	0.558
		Masc.	6.70	6.70	0.32	6.15	7.20	10	0.20	
	G4	Fem.	6.39	6.40	0.24	6.05	6.75	10	0.15	0.035*
		Masc.	6.68	6.56	0.32	6.40	7.33	10	0.20	

*significant value ($p<0.05$) – Test ANOVA
Caption: dB HL = decibels hearing level; Min = minor value; Max = maximum value; N = sample number; CI = confidence interval; G1 = 1st week newborn, G2 = 2nd week newborn; G3 = 3rd week newborn; G4 = 4th week newborn; Fem. = feminine; Masc. = masculine.

Under the same intensity, still regarding results obtained according to gender, it was found values significantly inferior in the feminine gender for interpeak latency I-III in G2, interpeak latency III-V in G1and interpeak latency I-V in G4 (Table 5).

Table 5 – Evaluation of the interpeak latencies as to the gender under intensity 80 dB HL

80 dB HL	Group	Gender	Mean	Median	Standard Deviation	Min	Max	N	CI	p-value
I-III	G1	Fem.	2.71	2.65	0.24	2.43	3.13	10	0.15	0.252
		Masc.	2.84	2.80	0.26	2.52	3.35	10	0.16	
	G2	Fem.	2.67	2.63	0.14	2.43	2.90	10	0.09	0.008*
		Masc.	2.90	2.89	0.20	2.63	3.23	10	0.12	
	G3	Fem.	2.84	2.85	0.14	2.58	3.10	10	0.09	0.702
		Masc.	2.82	2.83	0.14	2.60	3.03	10	0.09	
	G4	Fem.	2.59	2.61	0.15	2.40	2.80	10	0.09	0.131
		Masc.	2.73	2.66	0.26	2.40	3.20	10	0.16	
III-V	G1	Fem.	2.49	2.49	0.19	2.22	2.75	10	0.12	0.043*
		Masc.	2.35	2.36	0.10	2.10	2.45	10	0.06	
	G2	Fem.	2.44	2.45	0.18	2.15	2.65	10	0.11	0.159
		Masc.	2.33	2.34	0.14	2.13	2.55	10	0.09	
	G3	Fem.	2.40	2.35	0.25	2.15	2.82	10	0.15	0.499
		Masc.	2.31	2.38	0.34	1.70	2.85	10	0.21	
	G4	Fem.	2.27	2.24	0.22	1.88	2.70	10	0.13	0.101
		Masc.	2.40	2.41	0.11	2.23	2.58	10	0.07	
I-V	G1	Fem.	5.20	5.22	0.27	4.75	5.52	10	0.17	0.918
		Masc.	5.19	5.16	0.29	4.75	5.67	10	0.18	
	G2	Fem.	5.11	5.19	0.21	4.73	5.32	10	0.13	0.214
		Masc.	5.23	5.33	0.23	4.78	5.48	10	0.14	
	G3	Fem.	5.24	5.13	0.32	4.93	5.85	10	0.20	0.467
		Masc.	5.12	5.04	0.38	4.55	5.83	10	0.24	
	G4	Fem.	4.85	4.94	0.24	4.50	5.20	10	0.15	0.034*
		Masc.	5.13	5.01	0.30	4.85	5.73	10	0.18	

*significant value ($p<0.05$) – Test ANOVA

Caption: dB HL = decibels hearing level; Min = minor value; Max = maximum value; N = sample number; CI = confidence interval; G1 = 1st week newborn, G2 = 2nd week newborn; G3 = 3rd week newborn; G4 = 4th week newborn; Fem. = feminine; Masc. = masculine.

Opposite to the previous results, the interpeak latency III-V in G1 presented value inferior in the masculine gender.

Still regarding the findings according to the gender, however, under intensity 30 dB HL, it was proved there is no difference statistically significant on absolute latencies on waves III and V among groups (Table 6).

Table 6 – Evaluation of the absolute latencies as to the gender under intensity of 30 dB HL

30 dB HL Wave	Group	Gender	Mean	Median	Standard Deviation	Min	Max	N	CI	p-value
III	G1	Fem.	5.83	5.78	0.26	5.40	6.28	8	0.18	0.147
		Masc.	6.06	6.08	0.35	5.42	6.55	10	0.22	
	G2	Fem.	5.81	5.78	0.45	5.28	6.55	9	0.29	0.133
		Masc.	6.09	6.18	0.29	5.55	6.47	10	0.18	
	G3	Fem.	5.92	6.00	0.18	5.58	6.10	9	0.11	0.553
		Masc.	5.86	5.82	0.24	5.60	6.22	8	0.17	
	G4	Fem.	5.74	5.70	0.30	5.22	6.28	9	0.19	0.518
		Masc.	5.85	5.78	0.42	5.33	6.55	10	0.26	
V	G1	Fem.	8.09	8.09	0.32	7.63	8.55	10	0.20	0.908
		Masc.	8.07	8.14	0.33	7.58	8.68	10	0.21	
	G2	Fem.	8.07	7.94	0.49	7.42	8.78	10	0.31	0.761
		Masc.	8.13	8.09	0.33	7.53	8.55	10	0.21	
	G3	Fem.	7.94	7.85	0.31	7.67	8.55	10	0.19	0.180
		Masc.	8.14	8.16	0.31	7.70	8.63	10	0.19	
	G4	Fem.	7.68	7.63	0.33	7.15	8.13	10	0.20	0.148
		Masc.	7.92	7.88	0.38	7.38	8.65	10	0.24	

*significant value ($p<0.05$) – Test ANOVA

Caption: dB HL = decibels hearing level; Min = minor value; Max = maximum value; N = sample number; CI = confidence interval; G1 = 1st week newborn, G2 = 2nd week newborn; G3 = 3rd week newborn; G4 = 4th week newborn; Fem. = feminine; Masc. = masculine.

DISCUSSION

This study allowed to confirm what was reported in literature[9,12,13], that is, with increasing age the values of the absolute latencies of waves I, III and V reduces, due to the responses to ABR in newborns suffer influence of the maturational process of the auditory system[9].

The development and maturation of the peripheral portion of this system, which comprehend the external and mean ear, cochlea and eighth cranial nerve**,** where generates wave I, is complete around 24th gestational week and presents itself totally formed at birth[14]. Such process was evident in this study and is verified by the absolute latency of wave I, which reached the value similar to the adults yet on the first month of life. This maturation implies on the increasing of interpeak latency I-III and I-V and further shortening of it through aging, this was verified on this study and corroborates with literature[15]. Therefore it is extremely important to standard this outcome, since the misunderstanding of it can suggest, by mistake, the presence of retro-cochlear alteration.

A study conducted using the same stimulus, polarity, speed and equipment as this research and the same age population, obtained values of absolute latencies on waves I, III and V of 1.84 ms; 4.62 ms and 6.85 ms, respectively, have being found to interpeaks latencies the values 2.78 ms; 2.21 and 5.00. The absolute latencies values on waves I and III (1.58 ms and 4.34 ms) found in this study had shown to be inferior to the proposed on the above mentioned. However, the value of absolute latency on wave V (6.71 ms), as well as the interpeak latencies (2.72 ms; 2.37 ms and 5.13 ms) had shown to be similar to the previous study.

Moreover, the resulted of this research showed there is no difference between values of absolute and interpeaks latencies between right and left ear, what corroborates with other studies[11,16,17], for individuals with normal peripheral auditory system should present similar responses between ears, since the anatomic structures investigated by ABR belong to brainstem. Thus, they are used by both ear when there is sonorous stimulation[9,11].

The intraural difference corresponds to the difference value of interpeaks intervals I-V of right and left ear. According to literature[18], this value cannot exceed 0.3 ms or, according to other authors[19], cannot exceed 0.4 ms, otherwise can be diagnosed a retrocochlear alteration. In the present

study, it was observed that the averages found in the four groups are inferior to the values referred, supporting the literature[18,19].

Regarding to the gender, this study found absolute latencies on waves I,III and V inferior in feminine gender, under intensity 80 dB HL. This data supports other studies consulted[11, 20-22], and it is justified by the anatomic and diameter differences of the hearing nerve between genders[8, 23] or due to the fact of the cochlear responses to be faster in women[24].

This study disagrees to previous research[25] that did not find statistically significant difference for absolute latencies on waves I, III and V between genders under 80 dB HL.

The result of the absolute latency on wave V, under 30 dB HL, yet according to gender, confirms the study[25] developed with infants, under intensity 20 dB HL, which also did not observed differences between genders.

CONCLUSION

The present study obtained normative data in newborns to the equipment Smart EP - Intelligent Hearing Systems, version 2.40, which will be used in the electrophysiology laboratory of the Speech-Language Pathology and Audiology clinic at São Lucas University.

It can be conclude that the absolute latencies reduced with increasing age, having in newborns average 1.58 ms to wave I; 4.34 ms to wave III and 6.71 ms to wave V, under intensity 80 dB HL.

In the same way, the average of interpeaks I-III, III-V, I-V was inferior in G4 and the average in the first month was 2.76 ms, 2.37 ms and 5.13 ms, respectively.

As to the value of intraural difference, for the used equipment, it was found average 0.13 ms. To absolute latency on wave V under 30 dB HL the average was 8ms.

RESUMO

Objetivo: normatizar os achados do equipamento de PEATE da Clínica de Fonoaudiologia da instituição de origem, em recém-nascidos. **Métodos:** trata-se de um estudo transversal, exploratório não experimental do qual participaram quarenta recém-nascidos, sem indicadores de risco para a deficiência auditiva, que passaram na triagem auditiva neonatal, divididos de acordo com a idade, em semanas (G1, G2, G3 e G4). Para a coleta de dados foi utilizado o equipamento Smart EP-Intelligent Hearing Systems com estímulo clique. **Resultados:** a média dos valores das latências absolutas das ondas I, III e V de acordo com a idade são, respectivamente: G1=1,62ms, 4,39ms, 6,8ms; G2=1,62ms, 4,4ms, 6,79ms; G3=1,56ms, 4,39ms, 6,74ms; G4=1,54ms, 4,2ms, 6,53ms. Na mesma ordem, a média dos valores das latências interpico I-III, III-V e I-V foram: 2,77ms, 2,42ms e 5,19ms; 2,78ms, 2,39ms e 5,17ms; 2,83ms, 2,35ms e 5,18ms; 2,66ms, 2,33ms e 4,99ms. **Conclusão:** as latências absolutas diminuíram com o aumento da idade tendo média de 1,58ms para a onda I, 4,34ms para a onda III e 6,71ms para a onda V. Da mesma forma, as médias dos interpicos I-III, III-V e I-V foram menores no G4 e obteve-se médias, no primeiro mês, de 2,76ms, 2,37ms e 5,13ms.

DESCRITORES: Audição; Eletrofisiologia; Recém-Nascido; Potenciais Evocados Auditivos de Tronco Encefálico

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