

Z. Kheladze, E. Bibiluri, G. Chkhartishvili, Zv. Kheladze, N. Kajaia
The impact of sound waves on brain blood circulation in unconscious critical patients.
(Tbilisi, Georgia.)

“Critical Care & Catastrophe Medicine”, Tbilisi, Georgia, 2015, N15

here was examined 100 critical patients (60-man, 40 –woman), they were divided into 4 groups: The first group was treated with orthodox chants, the second group’s patients were provided with prayer with earphones. The third group was treated with classical music and the forth with audiometry high frequency sound waves (10 000hz). Patient’s age was between 35-80 year, whose work records hesitate between 5-35 year. The use of music, prayer, chant and audiometry system (high-frequency 10 000hz) waves as the instrument for treatment, have a significant impact on the unconscious patient’s brain blood supply system. Herewith these changes aren’t the same and are dependent on the frequency of sounds, amplitude and on the form of sound, according to what it expresses improvement of the brain’s blood supply system. This makes a distinct perspective for “sound waves” as one of the treatment methods in Critical Medicine.

Key Words: Critical patients, Unconscious patients, Classical music, Orthodox chants, Audiometry, Prayer, Music Therapy.

Introduction: Use of music as an instrument for treatment has a long history. (C. Dileo!999) According to Holy Bible, spiritually sick king of Israel, Saul was soothing while listening David’s song and the lyre. Unfortunately, there are no date about using music in treatment process critical patients. In the point, there is exception the works done Georgian Critical Care Medicine institute, with were the first attempt realised in this direction. By this study Georgian religious songs improve the cerebral blood circulation in unconscious critical patients and increase immunocompetent T-lymphocyte proliferation capacity in mono-directional mixed cultures (Z. Kheladze and other, 2012). Olsou, orthodox Christian praying cheinging the brain electrical activities (N. Nikabidze and other, 2013) and the brain blood circulation in unconscious critical patients (E. Bibiluri and other, 2014). The work is continued study of this problems.

Materials and Methods: From 100 critical patients (60-man, 40 –woman) examined, 65 were under 60 and 35 above 60. The examination was held by the use of music, prayer, chant, before and after the audiometry sounds. The main diagnosis was: blood circulation disorder in the brain, hypersomnia, Stupor coma, Guillain–Barré syndrome (GBS), Carbonic acid toxic effect, respiratory insufficiency, with associated illnesses as: arterial hypertension, heart insufficiency, pneumonia, renal insufficiency. All patients in critical conditions were unconscious and the level of coma with Glasgow’s scale was 3-7. All patients were conducted with artificial respiration, correction of water and electrolyte metabolism, parenteral and enteral nutrition, antibacterial therapy and other classical treatment. Patients were examined on arriving in clinic, also with the help of music, prayer, chant, also with an influence of the waves of audiometry sounds with a 10-minute irritations. Music was listened to with a mini tape-recorder’s headphones. Patients were divided into 4 groups: The first group was “treated” with an Orthodox chant. Patients in the second group were listening a prayer with the earphones. The third group’s patients were given to listen a piece of classical music by Mozart, Beethoven and other composers. The fourth group was given high audio frequency (10 000 hz) by audiometry. During the examination the blood circulation in the brain was monitoring. The arterial cerebral circulation was examined with a transcranial dopplerography. (Transcranial Doppler System TCD- IIX2P) (A. Aslid 1982). To generate transcranial dopplerography an impulsive low-frequency resonant was used. The Examination was held in the temple’s “window”, from which back and frontal cerebral arteries (R MCA, L MCA, RACA, L ACA) were tested. Occiput’s “window” was used too, from which the basilar artery’s blood linear speed (cm/sec) and the volume of the stream (millisec/minut) were

examined. Research was held with “double blind” experiment method and the results were evaluated with the variational statistical method. The trust efficiency coefficient was counted by 99% probability.

Results and Discussions:The results are presented in the tables. Table N1 show blood circulation of brain in critical patients. (Before and after prayer)

Patients		R MCA		L MCA	
		Linear Speed	Volume Speed	Linear Speed	Volume Speed
Background	X+-m	30+-0.009	130+-0.015	32+-0.009	128+-0.015
After Pray	X+-m	36+-0.2	155+-0.4	37+-0.2	155+-0.4
	N	120	120	120	120
	P	<0.001	<0.001	<0.001	<0.001

According to the following, figure linear speed (37+-0.7,P<0.001) and volume speed (154+-p<0.001) indexes of the blood, after the receiving of praying waves, were noticeably increased. That indicates the raising quantity of blood in the brain with an influence of praying waves.

Table N2 the blood circulation of the brain during the chant “treatment”

Patients		R MCA		L MCA	
		Linear Sp.	Volume Sp.	Linear sp.	Volume sp.
Background	X+-m	32+-0.009	128+-0.015	30+-0.009	130+-0.015
After listening to a chant	X+-m	36+-0.2	152+-0.3	37+-0.3	154+-0.4
	N	120	120	120	120
	P	<0.001	<0.001	<0.001	<0.001

During the chant, the linear speed of the blood index showed slight changes (36+-P>0.001). There was statistically reliable increasing of volume speed in all examined arteries, though. (155+-p<0.001). This indicates the rise of blood quantity in a brain during the chant.

Table N3 the blood circulation in the brain during the classical music “treatment”.

Patients		R MCA		L MCA	
		Linear sp.	Volume sp.	Linear sp.	Volume sp.
Background	X+-m	32+-0.009	128+-0.015	30+-0.009	130+-0.015
After istening the music	X+-m	35+-0.2	153+-0.3	35+-0.3	158+-0.4
	N	120	120	120	120
	P	<0.001	<0.001	<0.001	<0.001

According to the following figure, linear speed ($38 \pm$, $P < 0.001$) and volume speed ($158 \pm$, $p < 0.001$) indexes of the blood, after listening classical music, were noticeably increased into all examined arteries. Which indicates the raising quantity of blood in the brain with the influence of the waves of classical music.

Table N3 the blood circulation in the brain with an irritation of high frequency audiometry waves (8 000-10 000 hz)

Patients		R MCA		L MCA	
		Linear sp.	Volume sp.	Linear sp.	Volume sp.
Background	X+-m	32+-0.009	128+-0.015	30+-0.009	130+-0.015
Irritation with audiometry	X+-m	47+-0.23	210+-0.32	45+-0.23	200+-0.33
	N	120	120	120	120
	P	<0.001	<0.001	<0.001	<0.001

Allegedly, in this case there was sharp changes of the blood linear speed index ($47 \pm$, $P < 0.001$). There was statistically reliable increasing of volume speed in all examined arteries. ($200 \pm$, 1.9 , $P < 0.001$). Which indicates the raising quantity of blood in the brain with the influence of high frequency waves. The significant fact is that there were resembling changes in employees' blood circulation in the brain. In comparison to work without music, these changes were considerably slight, though. According to a comparison of the results, the group of employees' linear speed was high ($62.9 \pm$, 3.1 , $P < 0.005$) and volume speed-low ($131 \pm$, 2.1 , $P < 0.001$) without music. These changes were statistically reliable in all examined arteries, except for the left middle cerebral artery. This indicates to raising the vessel spasm while working without music.

Conclusion: The use of music, prayer, chant and audiometry system (high-frequency 10 000hz) waves as the instrument for treatment, have a significant impact on the unconscious patient's brain blood supply system. Herewith these changes aren't the same and are dependent on the frequency of sounds, amplitude and on the form of sound, according to what it expresses improvement of the brain's blood supply system. This makes a distinct perspective for "sound waves" as one of the treatment methods in critical medicine.

Referenses:

C.Dileo - „Music therapy and medicine. The practical and clinical applications”, “silver springs”. MD: American Music Therapy Association. 1999, -375pp.

Z.Kheladze, „Critical Care Medicine” - Tbilisi, 2007, -614pp.

Z.Kheladze, Zv.Kheladze, V.Tkemaladze-“Georgian religious songs improve the cerebral blood circulation in unconscious critical patients and increase immunocompetent T-lymphocyte proliferation capacity in mono-directional mixed cultures-”Critical Care and Catastrophe Medicine” 2012, N9-10, 33-38.

E.Bibiluri, Z.Kheladze, Zv.Kheladze- “The Influence of music waves in critical patient in unconscious condition” - “Critical Care and Catastrophe Medicine”, 2013, N12-13, 43-54.

ზ.ხელაძე, ეპიბილური, გ.ჩხარტიშვილი, ზ.ხელაძე, ნ.ქაჯაია
ბგერითი ტალღების გავლენა კრიტიკულ ავადმყოფთა თავის ტვინის
სისხლის მიმოქცევაზე

მოყვანილია კრიტიკულ ავადმყოფთა თავის სისხლის მიმოქცევის ცვლილებების თავისებურებანი მუსიკის, ლოცვების და სეაკლესიო საგალობლების გავლენით. ყველა

ავადმყოფი უგონო მდგომარეობაში იმყოფებოდა და აღენიშნებოდათ კომის 3-8 კომა გლაზგოს სკალით. მითითებულია, რომ ეს გამღიზიანებლები მნიშვნელოვან გავლენას ახდენენ უგონო მდგომარეობაში მყოფ კრიტიკულ ავადმყოფთა თავის ტვინის სისხლით მომარაგებაზე, რაც ამ საშუალებების მკურნალობის პროცესში გამოყენების პერსპექტივას სახავეს.