

G. Chkhartishvili, E. Bibiluri, N. Barnabishvili, N. Kajaia, Z. Kheladze, Zv. Kheladze

Studying of function and morphology of Heart and Liver in co-workers of the critical care medicine.

(Critical Care Medicine Institute, Tbilisi, Georgia)

Is studied some parameters of employees' heart and liver morphology and function of Critical Care Medicine. Workers of the field of Critical Care Medicine formed investigated persons' first group, the second group was composed with workers in the field of Non-Critical Medicine, and the third group included representatives of the administration. Their age ranged from 26 to 70 - years, among which 25 were women, and 6 were men, their working experience ranged from 5 to 35 years.

The received data indicate that, in employees working in the field of Critical Care Medicine compared to the representatives of administration and staff working in the field of Non-Critical Medicine the cardiac ejection fraction was slightly reduced and liver dimensions were slightly enlarged. However, these data do not represent pathology and should be considered as healthy person's data of marginal rates.

Key Words: Heart, Liver, function, morphology, co-workers, critical care.

Introduction: The technology of Critical Care Medicine has aggressive nature; it is directed not only to patients but also to medical staff. The work features which are expressed in permanent physical and psychological strain facilitates it. With this the staff suffers from daily impact of microbes, viruses and fungi antigens of a genetic "Substrates" existed in patient's body. Therefore, not only critical patients' health condition gains actuality, but also the study of the health condition of their servicing medical personnel. In this regard, previously conducted studies of the Institute of Critical Care Medicine has indicated the immune response inhibition of critical care medicine personnel (Z. Kheladze and others, 1998), Also there is information about the violation of cerebral circulation in transit form of critical care personnel (Z. Kheladze and others, 2012). Unfortunately, there is no data in the context of research about functional and morphological conditions of heart and liver of critical care medicine personnel. Such information has some importance for evaluation the aggression level on critical care medicine staff and for preventative measures.

Materials and Methods: ad been examined 31 workers of "Critical Care Medicine Institute," from the age of 26 to 70 years old, among them were as doctors and managers also nurses, medics and other employees of clinic of "Critical Care Medicine Institute," from these employees 25 were women and 6 were men, their working experience ranged from 5 - to 35 years of age.

During this study, they were divided into three groups: workers in the field of Critical Care Medicine, workers in the None-Critical medicine and administration representatives. In addition, examined workers were divided in accordance with their working experience. In this regard, in the first group were those persons who had 5-10 years working experience, and in the second group the persons having 10 - 30 years working experience.

Echological Research on the heart and liver was conducted by "Myndray-5" (china) – equipment. At the time was evaluated heart condition (camera sizes, valvular apparatus, EF, FS of left ventricular systole and diastolic functions), also were determined liver sizes, parenkim structure and echogenicity, liver-internal ducts and blood vessels. Liver function was described by specifying alaninaminotransferasis (ALT) and aspartate aminotransferase (AST) of blood enzyme, this latter one was carried through kinetic method using 340 nm length waves. Also was used GYPRES DIAGNOSTIGS (Belgium) test system. Biochemical results were recorded in the semi-automatic GLINDIAG model SA-20 Analyzer.

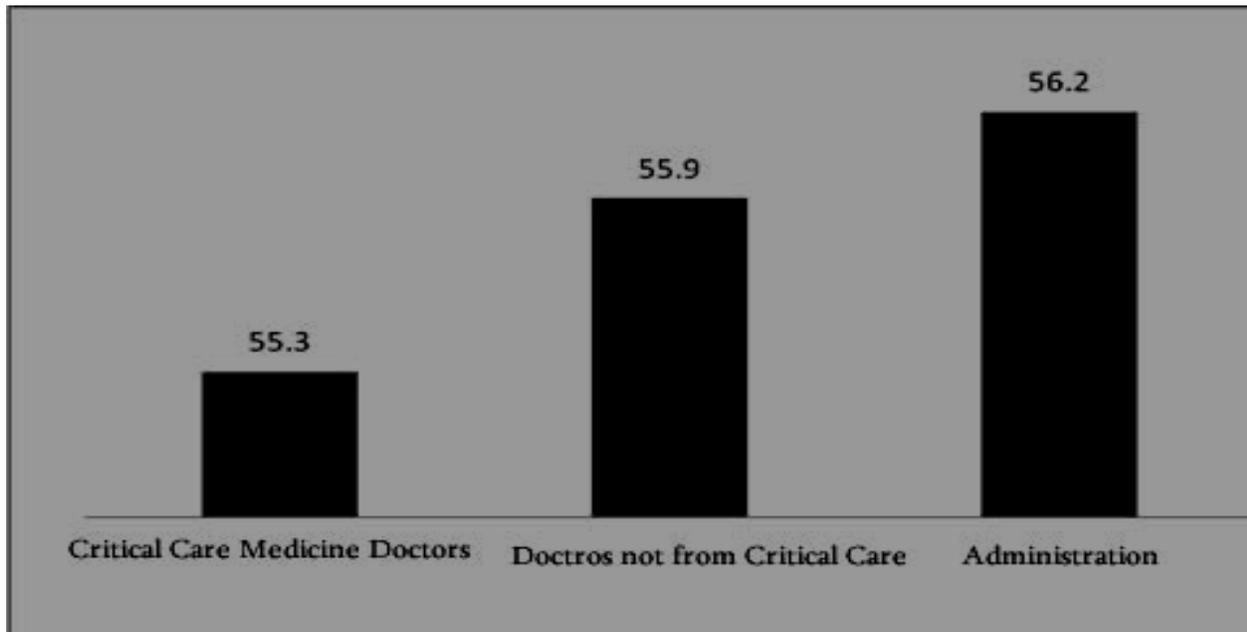
The study had been carried out before and after the working day. The study was conducted through double-blind method and the result was processed by the method of variation statistics.

Results and discussion: The results are presented in tables and diagrams below:

Table - N1 (cardiac systolic function pointer)

N	Examined Groups:		EF % (Ejection fraction)
1.	Critical Care Doctors:	$X \pm m$	55.3 ± 0.1
2.	None-critical Care Doctors:	$X \pm m$ $P1/2$	55.9 ± 0.1 $P < 0.001$
3.	Administration:	$X \pm m$ $P1/3$	56.2 ± 0.1 $P < 0.001$

Diagram N1- cardiac systolic function pointer

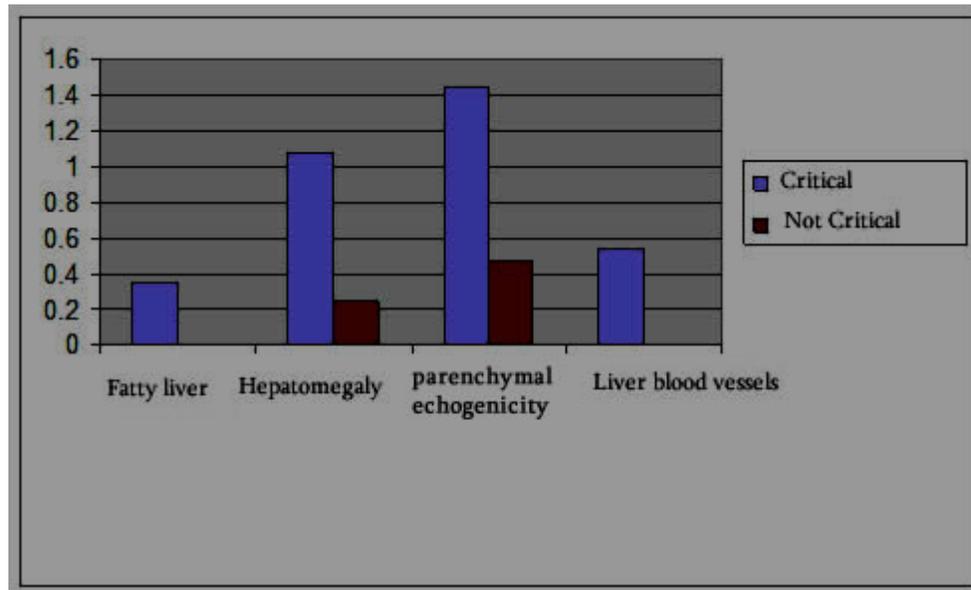


In the 1st table and diagram is given a graph of the rate of cardiac systolic function (EF %), this latter one in Critical Care Medicine workers is at the lower limit $55,3 \pm 0,1$, ($P < 0,001$). In None-Critical doctors is higher $55,9 \pm 0,1$ ($P < 0,001$), but in administration personals is comparatively increased $56,2 \pm 0,1$ ($P < 0,001$). Also among Critical Care Medicine staff in 5% of workers was observed cardiac valvular apparatus changes, it was reflected in Mitral valve light prolaps in the heart Triptych fibrosis and age-appropriate carsinosis, but they do not cause significant defect or stenosis. In the 3% is observed- slight hypertrophy of left ventricular, and in 2% -the hipocinesis areas (in right coronary artery-RCA basin)

Table N -2 (liver ultrasound findings)

Groups	Changes%	Liver fattening	Hepatomegalia	Echogenicity increase of Parenkimi	An upper diameter edge of liver-internal blood vessels
Critical care		0,4%	1,1%	1,4%	0,5%
Non-critical care		–	0,2%	0,5%	–
Administration		–	–	–	–

Diagram N 2-liver ultrasound findings

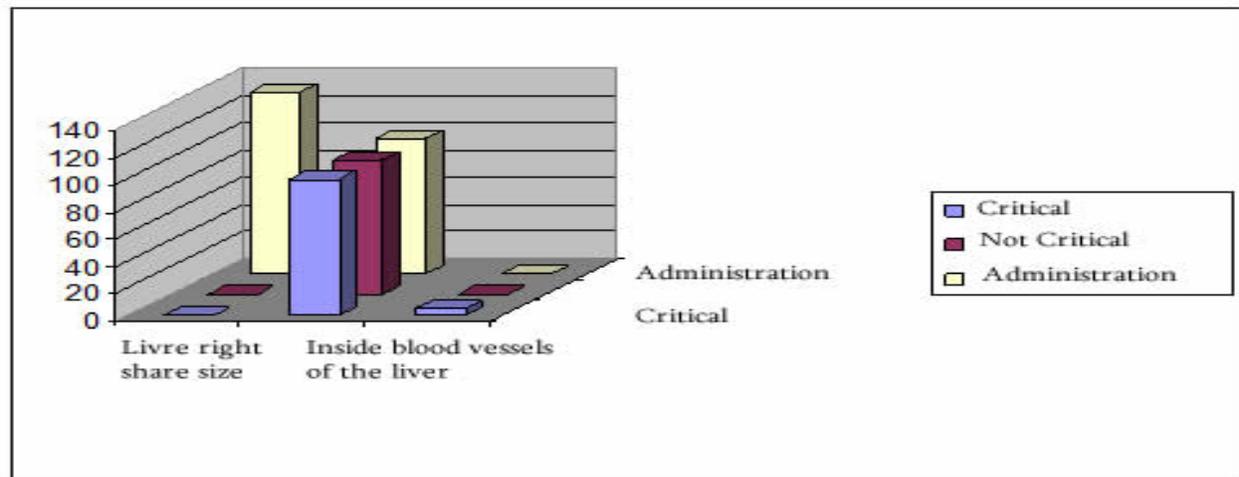


In the 2nd table and diagram is shown liver research echological indicators, where we see that 0.4% of Critical Care Medicine staff has liver fattening, 1.1% - hepatomegaly, parenkim echogenicity is increased in 1.5%, and the diameter of liver-internal blood vessels is increase to 0.5% - though this growth is not beyond the upper limit of norm.

Table N 3- Morphological data received by liver ultrasound research

N	Groups		Liver right share size: mm	Liver left share size: mm	Liver-internal blood vessels: mm
1	Critical Care	x±m	137,3 ± 0,16	99,8 ± 0,08	5±0,009
2	None-critical Care	x±m P 2/1	133,9 ± 0,33 p<0.001	97,9 ± 0,005 P<0,001	4,8±0,4 p>0,05
3	Administration	x±m P 3/1	133 ± 0,52 p>0,05	98,4 ± 0,03 p<0,001	4,6 ± 0,27 p>0,05

Diagram N3-Morphological data received by liver ultrasound research N -3

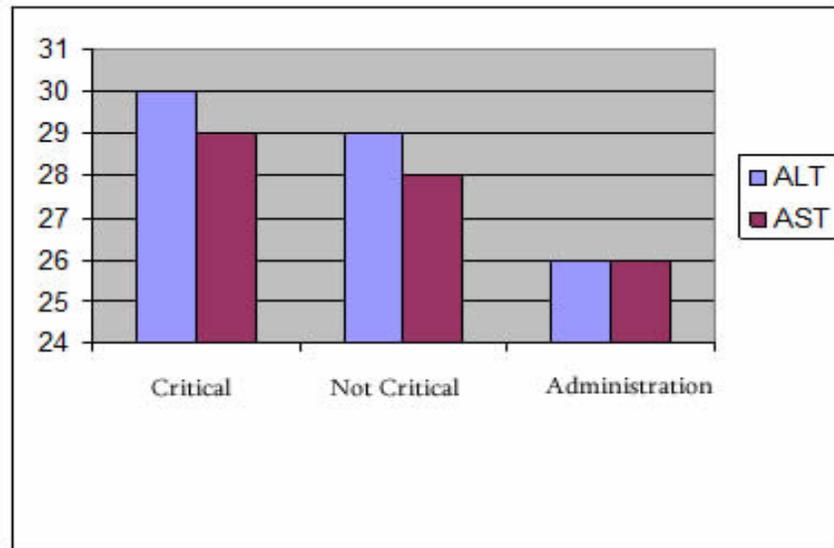


The 3rd table and diagram shows that in Critical Care Medicine staff the right share craniocaudal size of liver is high than in None-Critical field staff and administration officials, however, it did not go beyond the normal upper limit of $137,3 \pm 0,16$, ($P < 0,001$). The similar figures are shown on the left share. The Critical Care group's index is $99,8 \pm 0,08$, ($P > 0,001$), while Non-Critical group's index is $97,9 \pm 0,005$, ($P < 0,001$), and administrative group's index is $98 \text{ mm} \pm 0,03$. As for liver-internal ducts, their diameter does not exceed to 1 mm in none of this groups. Diameter of door veins is 12 mm. In the Critical Care group compared to other groups the diameter of liver-internal blood vessels was closest to the upper limit of norm ($5 \pm 0,009$), although the latest data are not statistically reliable. ($P > 0,05$).

Table N -4 (Indexes of alaninaminotransferasis and aspartate aminotransferase)

N	Groups		ALT	AST
1	Critical Care	$x \pm m$	$29 \pm 0,9$	$29 \pm 1,002$
2	None-critical Care	$x \pm m$	$28 \pm 1,07$	$28 \pm 1,2$
		$p_{1/2}$	$p > 0,05$	$p > 0,05$
3	Administration	$x \pm m$	26 ± 2	26 ± 2
		$p_{1/3}$	$p > 0,05$	$p > 0,05$

Diagram N 4- Indexes of alaninaminotransferasis and aspartate aminotransferase



In the 4th table and diagram is shown liver function tests data, which shows that the parameters of alaninaminotransferasis (ALT) and aspartate aminotransferase (AST) are statistically unreliable ($P > 0,05$) they differ from each other in each group.

Conclusion: In the field of Critical Care Medicine staff compared to the none-critical staff and administration officials was observed reduction of cardiac ejection fraction, and liver echological measures enlargement. However, they do not represent Pathology, and should be considered as healthy person's data of marginal rates.

Reference:

1. Z. Kheladze (1998). „The new steps in the Critical Care Medicine.“ Institute of the Critical Care Medicine, Tbilisi; P215
2. <http://www.ccmi.edu.ge/>
3. Z. Kheladze. „Critical Care & Catastrophe Medicine“, (Tbilisi, Georgia 2007)

გ. ჩხარტიშვილი, ე. ბიბილური, ზ. ხელაძე, ზგ. ხელაძე,
გულისა და ღვიძლის მორფოლოგიისა და ფუნქციის შესწავლა კრიტიკული
მედიცინის სამსახურის თანამშრომლებში.
(კრიტიკული მედიცინის ინსტიტუტი, თბილისი, საქართველო)

შესწავლილა კრიტიკული მედიცინის სამსახურის თანამშრომელთა გულისა და ღვიძლის მორფოლოგია და ფუნქცია. გამოკვლევულ პირთა პირველ ჯგუფს შეადგენდნენ კრიტიკული მედიცინის სფეროში მომუშავე თანამშრომლები, მეორე ჯგუფი დაკომპლექტებული იყო არაკრიტიკული მედიცინის სფეროში მომუშავე თანამშრომლებით, ხოლო მესამე ჯგუფი მოიცვა ადმინისტრაციის წარმომადგენლებმა. მათი ასაკი მერყეობდა 26–დან 70–წლამდე, აქედან ქალი იყო 25, მამაკაცი კი–6, მათი საშუალო სტაჟი მერყეობდა 5–დან 35–წლამდე. მიღებული მონაცემები მიუთითებენ, რომ უშუალოდ კრიტიკული მედიცინის სფეროში მომუშავე თანამშრომელთა გულის განდევნის ფრაქცია მცირედ არის შემცირებული, ხოლო ღვიძლის ზომები უმნიშვნელოდ გადიდებულია. თუმცა ეს მონაცემები არ წარმოადგენენ პათოლოგიას და „ნორმის“ ფარგლებშია.