

## THERAPEUTIC IMPACT OF THE ATTITUDE AND NEW KNOWLEDGE ABOUT DISEASE: A QUESTIONNAIRE STUDY

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**SUMMARY** – The aim of the study was to investigate the attitude towards alcoholism and patients with alcoholic cirrhosis, and to assess the knowledge of pathophysiology and treatment of ascites in liver cirrhosis in the physicians from hospitals in Atlanta and Zagreb. Internists and internal medicine residents were asked to fill-out a questionnaire containing 14 questions on the attitude towards alcoholism and patients with alcoholic cirrhosis, and on the knowledge of ascites pathophysiology and treatment. The study was conducted at University Departments of Medicine at Sestre milosrdnice University Hospital and Zagreb University Hospital Center from Zagreb, Croatia (n=40), and Emory School of Medicine from Atlanta, Georgia, USA (n=30). In the Zagreb group, there were significantly more internists (p=0.025) with significantly more years of specialist service (p=0.006). Significant difference between the two groups was recorded in their answers to questions on alcoholism (p=0.006), correct concept of pathophysiology of ascites formation (p<0.001), cardiac output in liver cirrhosis (p<0.001), plasma aldosterone concentration on upright posture test in preascitic liver cirrhosis (p=0.030), atrial natriuretic peptide (p<0.001), therapeutic impact of spironolactone (p=0.005), and paracentesis (p=0.009), as well as in the frequency of correct answers to questions on alcoholism (p=0.002), cardiac output in liver cirrhosis (p=0.001) and plasma aldosterone concentration on upright posture test in preascitic liver cirrhosis (p=0.005), with the Zagreb group scoring worse and, according to sex, also in the knowledge of the century of Leonardo da Vinci's birth (p=0.018). Negative attitude towards alcoholism and alcoholic cirrhosis in the Zagreb respondents, and the lack of knowledge about the basic pathophysiologic mechanism of ascites formation and new treatment algorithms in liver cirrhosis were recorded in both groups. The attitude and knowledge influence treatment decisions. The clinicians' knowledge about the effectiveness of a novel or established treatment protocol including modification in the indications or method and its timing is indispensable.

**Key words:** *Liver cirrhosis, therapy; Liver cirrhosis, complications; Ascites, etiology; Ascites, prevention and control; Questionnaires; Data collection*

### Introduction

In spite of well documented clinical studies of new treatment algorithms, the acceptance of new knowledge about diseases requiring changes in the established therapeutic protocol is often slowed down. The deep-rooted

habits are difficult to change; Steven Wolf wrote in 1962 "We always endeavor for our young people to make researches. Basic researches are encouraged, and clinical ones are accepted. Therapeutic researches, however, are often looked at with resentment".

There are about 200,000 registered alcoholics in Croatia, and taking their family members in consideration, it comes up to a minimum of 800,000 persons affected by this serious illness. The alcoholic disease is one of the most common medical consequences of alcohol abuse. In the USA, it is a major cause of mortality from liver cirrhosis

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As one of the most common complications of advanced liver disease, ascites is in 80% - 85% of cases associated with alcoholic disease, most often Laennec cirrhosis<sup>5</sup>. The survival prognosis in patients with liver cirrhosis and ascites is connected with mortality due to gravity and complications of the basic disease as well as due to ascites itself and its treatment<sup>6-8</sup>. Since the late 1980s, a renaissance of therapeutic paracentesis has taken place owing to the studies by the Barcelona group<sup>9</sup>, who proved its efficacy and/or harmlessness if paralleled by expanding plasma volume with albumin infusion. The failure of ascites treatment and consequently shorter life expectancy and deteriorated quality of life in patients with liver cirrhosis have now been attributed to noncompliance, rare achievement of abstinence from alcohol abuse, and poor socioeconomic and nutritional conditions in most patients. It is unjustifiable to tolerate poor clinical practice in the treatment of ascites, which includes removal of ascites under outpatient treatment conditions without complying with basic sterility requirements, in inadequate amount, and with continuous presence of high intra-abdominal pressure, or removal of 6 or more liters of ascites *per* treatment with no plasma volume expansion, thus perpetuating further aggravation of sodium and water retention by the kidneys.

Because of the lack of prospective studies assessing the diagnostic or therapeutic attitudes of physicians, there is very little information on how scientific results influence clinical practice. The aim of the present study was to investigate differences in the attitude towards patients with alcoholic cirrhosis and its complications, and in the knowledge of ascites pathophysiology and treatment, as the possible reasons for nonacceptance of the new therapeutic models of ascites treatment in liver cirrhosis, between the internists and internal medicine residents at two university hospitals from Zagreb, Croatia, and Emory School of Medicine from Atlanta, Georgia, USA, the latter being the school supporting the results of the research performed by the Barcelona group<sup>9</sup>.

## Subjects and Methods

A questionnaire containing 14 questions was filled-out by staff members of the University Departments of Medicine at Sestre milosrdnice University Hospital and Zagreb University Hospital Center from Zagreb, Croatia, and Emory School of Medicine from Atlanta, Georgia, USA. The questions were categorized into five groups: professional and sex definition of the respondent (1-5), alcoholism and alcoholic cirrhosis (6, 7), pathophysiology of liver cirrhosis

(8, 9, 11, 12), knowledge of history and civilization (10), and treatment of liver cirrhosis (13, 14) (Table 1). The first five questions asked about demographics of the group: internist or internal medicine resident, internal medicine subspecialty, years of specialist service or residency, and sex. Questions 6-14 were multiple-choice questions with 3-7 possible answers. Correct answers were first assessed by the researchers and then reviewed and approved by two independent reviewers. The questionnaire for Zagreb respondents was written in Croatian, and for those in Atlanta in English. At all locations the survey took place in the morning, without prior notice, and the questionnaire forms were distributed to all members of the department present at the morning round. This was a voluntary survey with a 100% response rate in Atlanta and 85% in Zagreb.

## Statistics

Data were processed by descriptive statistics methods, and results were expressed as absolute figures and percentage. Analysis of the results was done by  $\chi^2$ -test, whereas the level of statistical significance was set at  $p < 0.05$ . The SAS System for Windows Release 6.12 (SAS Institute Inc., Cary, NC, USA) software package was used on data analysis.

## Results

Thirty physicians from Atlanta, 13 (43.3%) internists and 17 (56.7%) internal medicine residents, and 40 physicians from Zagreb, 28 (70.0%) internists and 12 (30.0%) internal medicine residents, took part in the survey. A statistically significantly higher number of internists participated in the Zagreb group ( $p = 0.025$ ). Although there were no endocrinologists, immunologists and nephrologists in the Atlanta group, there were no significant differences among the represented subspecialties ( $p = 0.635$ ). There was a statistically significant difference in the years of specialist service ( $p = 0.006$ ) and age between the internists from Atlanta and Zagreb: as many as 18 (64.3%) internists from Zagreb had 11-20 or more than 20 years of specialist service. There was no significant between group difference in the distribution of residents according to year of residency ( $p = 0.821$ ) or sex ( $p = 0.616$ ) (Table 2).

There was a statistically significant between group difference in their answers to the question on alcoholism ( $p = 0.006$ ). All Atlanta respondents considered alcoholism a disease, whereas in the Zagreb group as many as eight (20.0%) respondents (three gastroenterologists, two cardiologists and one hematologist, three of them with 11-20

Table 1. Questionnaire and frequency of answers<sup>a</sup>

Question	Atlanta (n=30) No. (%) of answers	Zagreb (n=40) No. (%) of answers	p
Alcoholism is:			
a. Socially acceptable behavior	0	0	0.006
b. Unreasonable behavior	0	1 (2.5)	
c. Self-destructive behavior	0	8 (20.0)	
d. Disease *	30 (100.0)	29 (72.5)	
e. Incurable disease	0	2 (5.0)	
Alcohol-related liver cirrhosis is:			
a. Deserved consequence of unhealthy life style	1 (3.3)	3 (7.5)	0.879
b. Moderately progressive, treatable disease provided abstaining *	29 (96.7)	35 (87.5)	
c. Incurable disease – should be treated with liver transplantation	0	1 (2.5)	
d. Incurable disease – no further effort in treatment	0	1 (2.5)	
Correct concept of the pathophysiology of ascites formation in liver cirrhosis is:			
a. The “peripheral arterial vasodilatation ” hypothesis *	0	1 (2.5)	<0.001
b. The “underfilling” hypothesis	0	1 (2.5)	
c. The “overflow ” theory	1 (3.3)	6 (15.0)	
d. a+b+c	29 (96.7)	18 (45.0)	
e. None of the above	0	14 (35.0)	
Cardiac output in liver cirrhosis is:			
a. Increased *	26 (86.7)	18 (45.0)	<0.001
b. Decreased	4 (13.3)	20 (50.0)	
c. No change in comparison with healthy subjects	0	2 (5.0)	
Leonardo da Vinci was born in:			
a. 13 <sup>th</sup> century	2 (6.7)	3 (7.5)	0.588
b. 14 <sup>th</sup> century	9 (30.0)	8 (20.0)	
c. 15 <sup>th</sup> century *	16 (53.3)	20 (50.0)	
d. 16 <sup>th</sup> century	3 (10.0)	6 (15.0)	
e. 17 <sup>th</sup> century	0	3 (7.5)	
In preascitic liver cirrhosis, in the upright posture test, aldosterone is:			
a. Increased *	28 (93.3)	26 (65.0)	0.030
b. Decreased	1 (3.3)	3 (7.5)	
c. No change in comparison with healthy subjects	1 (3.3)	8 (20.0)	
d. No change in comparison with the levels obtained in basal supine position	0	3 (7.5)	
Atrial natriuretic peptide, a hormone secreted by cardiac atria, causes:			
a. Decreased urine output	0	3 (7.5)	<0.001
b. Tachycardia	17 (56.7)	3 (7.5)	
c. Increase in circulating volume	0	6 (15.0)	
d. Increase in mean arterial pressure	0	2 (5.0)	
e. Sodium retention	0	0	
f. a+b+d	0	2 (5.0)	
g. None of the above *	13 (43.3)	24 (60.0)	
Spironolactone, aldosterone antagonist, is used in cirrhosis in order to:			
a. Improve urine output due to synergistic effect with loop diuretics	14 (46.7)	11 (27.5)	0.005
b. Maintain electrolyte balance in patients with tense ascites	1 (3.3)	7 (17.5)	
c. Prevent recurrence of fluid accumulation after paracentesis	10 (33.3)	6 (15.0)	
d. Reduce portal hypertension in patients with esophageal varices, no ascites	1 (3.3)	0	
e. a+b+c+d *	4 (13.3)	8 (20.0)	
f. a+c	0	8 (20.0)	
Therapeutic paracentesis of the ascites in liver cirrhosis:			
a. Requires hospitalization for at least 24 hours	3 (10.0)	0	0.009
b. Strict aseptic technique must be used	4 (13.3)	17 (42.5)	
c. Ascitic fluid can be completely evacuated	0	1 (2.5)	
d. 4-6 liters of ascites are routinely evacuated	13 (43.3)	15 (37.5)	
e. Requires volume replacement after the procedure	0	1 (2.5)	
f. a+b+c+d+e *	10 (33.3)	6 (15.0)	
g. b+c	0	0	

<sup>a</sup> Asterisk indicates correct answer.

Table 2. Description of study subjects

	Atlanta (n=30) No. (%) of subjects	Zagreb (n=40) No. (%) of subjects	p
Professional status:			
Specialist in internal medicine	13 (43.3)	28 (70.0)	0.025
Resident in internal medicine	17 (56.7)	12 (30.0)	
Subspecialty			
Endocrinologist	0	2 (7.1)	0.635
Gastroenterologist	6 (46.2)	8 (28.6)	
Hematologist	1 (7.7)	5 (17.9)	
Specialist in intensive care medicine	2 (15.4)	2 (7.1)	
Immunologist	0	0	
Cardiologist	4 (30.8)	8 (28.6)	
Nephrologist	0	3 (10.7)	
Duration of specialization (years)			
1 - 3	4 (30.8)	4 (14.3)	0.006
4 - 10	8 (61.5)	6 (21.4)	
11 - 20	1 (7.7)	10 (35.7)	
> 20	0	8 (28.6)	
Year of residency in internal medicine (years)			
1	3 (17.6)	2 (16.7)	0.821
2	5 (29.4)	4 (33.3)	
3	8 (47.1)	4 (33.3)	
4	1 (5.9)	2 (16.7)	
Sex			
Male	18 (60.0)	27 (67.5)	0.616
Female	12 (40.0)	13 (32.5)	

years and three with more than 20 years of specialist service, and two third-year female residents) considered alcoholism a self-destructive behavior. Two third- and fourth-year female residents (5%) thought that alcoholism was an incurable disease, whereas one nephrologist with more than 20 years of specialist service (2.5%) considered it to be a form of unreasonable behavior. There was no statistically significant difference in the understanding of alcoholic cirrhosis ( $p=0.879$ ). Twenty-nine (96.7%) Atlanta respondents and 35 (87.5%) Zagreb respondents agreed that liver cirrhosis was a moderately progressive, treatable disease, provided the patients abstained from alcohol intake. Three (7.5%) Zagreb respondents who considered alcoholism a self-destructive behavior also considered that alcoholic cirrhosis was a deserved consequence of unhealthy lifestyle. Their opinion was shared by only one (3.3%) Atlanta respondent. One female resident from Zagreb (2.5%) was of the opinion that liver cirrhosis was an incurable, progressive disease that did not deserve additional effort in understanding and treatment.

Twenty-nine (96.7%) Atlanta respondents considered all three suggested concepts of the pathophysiology of ascites formation to be correct, whereby they differed statistically significantly from the Zagreb group ( $p<0.001$ ), where 18 (45.0%) respondents shared their opinion. Of all respondents, only one second-year resident from Zagreb (2.5%) chose the correct answer, i.e. the peripheral arterial vasodilatation theory published in 1988<sup>1</sup>. As many as 14 (35.0%) Zagreb respondents, i.e. four residents and ten internists, were of the opinion that none of the suggested concepts was correct. The difference in answers to the question on cardiac output in liver cirrhosis was also significant ( $p<0.001$ ): 28 (86.7%) Atlanta respondents knew it was increased, as compared with 22 (55.0%) Zagreb respondents who did not know it. Eleven (39.2%) internists, eight of them with 11-20 years and three with 1-3 years of specialist service (four cardiologists, three gastroenterologists, two hematologists and two nephrologists) and nine (75.0%) residents from Zagreb were of the opinion that cardiac output in liver cirrhosis was decreased. Eight (20%)

Zagreb respondents who considered alcoholism a self-destructive behavior also believed that cardiac output was decreased in liver cirrhosis.

There was no significant difference in the interviewed persons' knowledge about the century of birth of Leonardo da Vinci ( $p=0.588$ ), the author of the drawing known as "Vitruvian man, study of proportions", an illustration often used in medical publications and logos, almost a synonym for medical literature: 46.7% of Atlanta and 50.0% of Zagreb respondents did not know that Leonardo da Vinci (1452 – 1519) had been born in the 15<sup>th</sup> century, easily mixing up a hundred years; all 20 (50.0%) respondents from the latter group believed that cardiac output in liver cirrhosis was decreased, and eight (20.0%) of them thought that alcoholism was a form of self-destructive behavior.

The difference in the knowledge about plasma aldosterone concentration in liver cirrhosis in the preascitic stage on upright posture test was significant ( $p=0.030$ ): 28 (93.3%) respondents from Atlanta and 26 (65.0%) from Zagreb knew that it was increased. The difference in the answer concerning biological effects of atrial natriuretic peptide was also significant ( $p<0.001$ ): 24 (60.0%) Zagreb respondents knew that none of the suggested options was correct, as compared with 13 (43.3%) Atlanta respondents who agreed with them and 17 (56.7%) respondents who believed that one of the biological effects was tachycardia. The difference in answers to the question on therapeutic impact of spironolactone was significant ( $p=0.005$ ): four (13.3%) Atlanta and eight (20.0%) Zagreb respondents chose correct answers. There was a large discrepancy in answers to the last question concerning therapeutic para-

centesis for ascites in liver cirrhosis ( $p=0.009$ ): ten (33.3%) Atlanta and six (15.0%) Zagreb respondents chose the correct answer (Table 1).

The frequency analysis of correct answers (Table 3) revealed significant differences in the questions on alcoholism ( $p=0.002$ ), cardiac output in liver cirrhosis ( $p=0.001$ ), plasma aldosterone concentration on upright posture test in preascitic liver cirrhosis ( $p=0.005$ ), whereby the Zagreb group scored worse. Only one second-year internal medicine resident from Zagreb (2.5%) answered all questions correctly. In the groups of specialists as compared with residents, the frequency analysis of correct answers within the Atlanta and Zagreb groups yielded statistical significance only with regard to the question on alcoholic cirrhosis ( $p=0.022$ ) provided by 27 (96.4%) internists and eight (66.7%) internal medicine residents from Zagreb (Table 4). There was no significant difference in correct answers between various subspecialties, all gastroenterologists as compared with other subspecialties, according to years of specialist service and year of residency for either Atlanta or Zagreb group. The frequency analysis of correct answers according to sex showed statistical significance ( $p=0.018$ ) between ten (37.0%) male and ten (76.9%) female Zagreb respondents according to their knowledge of the century in which Leonardo da Vinci had been born (Table 5).

## Discussion

The negative attitude towards alcoholism (20.0%) and alcoholic cirrhosis (7.5%) recorded in Zagreb respondents should not trigger negative countertransfer towards alco-

Table 3. Frequency analysis of correct answers

Question	Atlanta (n=30) No. (%) of correct answers	Zagreb (n=40) No. (%) of correct answers	p
Alcoholism is:	30 (100.0)	29 (72.5)	0.002
Alcohol-related liver cirrhosis is:	29 (96.7)	35 (87.5)	0.175
Correct concept of the pathophysiology of ascites formation is:	0	1 (2.5)	0.383
Cardiac output in liver cirrhosis is:	26 (86.7)	18 (45.0)	0.001
Leonardo da Vinci was born in:	16 (53.3)	20 (50.0)	0.782
In preascitic liver cirrhosis, in upright posture test aldosterone is:	28 (93.3)	26 (65.0)	0.005
Atrial natriuretic peptide, a hormone secreted by cardiac atria, causes:	13 (43.3)	24 (60.0)	0.167
Spironolactone, aldosterone antagonist, is used in cirrhosis in order to:	4 (13.3)	8 (20.0)	0.464
Therapeutic paracentesis of tense ascites in liver cirrhosis:	10 (33.3)	6 (15.0)	0.071

Table 4. Frequency analysis of correct answers among internal medicine residents and internists

Question	Atlanta Internists (n=13)	Residents (n=17)	p	Zagreb Internists (n=28)	Residents (n=12)	p
	No. (%) of correct answers	No. (%) of correct answers		No. (%) of correct answers	No. (%) of correct answers	
Alcoholism is:	13 (100.0)	17 (100.0)	–	21 (75.0)	8 (66.7)	0.589
Alcohol-related liver cirrhosis is:	13 (100.0)	16 (94.1)	0.374	27 (96.4)	8 (66.7)	0.022
Correct concept of the pathophysiology of ascites formation is:	0	0	–	0	1 (8.3)	0.122
Cardiac output in liver cirrhosis is:	10 (76.9)	16 (94.1)	0.170	15 (53.6)	3 (25.0)	0.096
Leonardo da Vinci was born in:	8 (61.5)	8 (47.1)	0.431	13 (46.4)	7 (58.3)	0.490
In preascitic liver cirrhosis, in upright posture test aldosterone is:	13 (100.0)	15 (88.2)	0.201	18 (64.3)	8 (66.7)	0.885
Atrial natriuretic peptide, a hormone secreted by cardiac atria, causes:	8 (61.5)	5 (29.4)	0.078	17 (60.7)	7 (58.3)	0.888
Spirolactone, aldosterone antagonist, is used in cirrhosis in order to:	3 (23.1)	1 (5.9)	0.170	6 (21.4)	2 (16.7)	0.730
Therapeutic paracentesis of tense ascites in liver cirrhosis:	6 (46.2)	4 (23.5)	0.193	5 (17.9)	1 (8.3)	0.440

holics who fail to observe medical advice and reluctance to accepting novel methods of treatment. Alcoholism is a disease, and is no more immoral than, for instance, diabetes mellitus or coronary disease. All other answers recorded in the survey suggest a different attitude towards the patient with a possibility of negative countertransfer<sup>11</sup> the negative attitude of the society towards alcoholics has its mirror image among physicians, which can clearly be observed in setting moral and marketing criteria for integrating patients with alcoholic cirrhosis in liver transplantation programs<sup>12</sup>. Although, like Atterbury<sup>12</sup>, we severely condemn any alcohol abuse and its consequences, we do agree with him that no medical decision about treatment options should include the term 'worthiness or social value'. Some 10% to 15% of alcoholics will develop liver cirrhosis, the pathogenesis including sex, frequency and pattern of drinking, nutritional status, hereditary factors, and environmental influences<sup>3</sup>. Mortality due to liver cirrhosis is considered to be the most important indicator of diseases caused by alcohol abuse in the general population<sup>14</sup>.

The results of our study indicate the lack of knowledge about the basic pathophysiologic mechanisms of ascites formation in both groups, which certainly influences treatment related decisions and acceptance of new treatment models. Several hypotheses have been elaborated in an attempt to explain ascites formation in liver cirrhosis: the underfilling hypothesis<sup>5,16</sup>, the overflow theory<sup>7</sup>, and since 1988 the peripheral arterial vasodilatation hypothesis ac-

cepted by the majority of investigators<sup>15</sup>. Acceptance of the latter theory as a correct one is the basis for acquiring further up-to-date knowledge about hemodynamic changes, water and sodium retention in cirrhosis, and thus the basis for therapeutic algorithms in the management of ascites. The Atlanta respondents' answer that all three theories on ascites formation are correct does not apply; the last hypothesis has partly resulted from the criticism of the first two theories. Similarly both experimental and clinical studies of cardiac output in liver cirrhosis as well as the role of renin-angiotensin-aldosterone system, atrial natriuretic peptide, sodium and water retention by the kidneys, and ascites formation are crucial for novel therapeutic models of ascites management in liver cirrhosis.

Studies performed by Bernardi *et al.*<sup>18</sup> have revealed that sodium and water retention in patients with liver cirrhosis precedes ascites formation and results in an increased total plasma volume that depends on body posture, physical activity and plasma aldosterone concentration. The increase in plasma aldosterone concentration and decrease in natriuresis in upright posture (in which humans spend 2/3 of the day) very likely are the compensatory mechanism for the increase in total plasma and blood volume in the conditions of enlarged splanchnic basin in the development of portal hypertension. The knowledge of this pathophysiologic mechanism clearly points to the benefit of bedrest in the treatment of patients with cirrhosis in the preascitic and ascitic stage of the disease<sup>18,19</sup>.

The main goal of ascites treatment in patients with liver cirrhosis was unclear to the majority of survey participants. The lack of knowledge about the results of the study of Bernardi *et al.*<sup>18</sup> and Trevisani *et al.*<sup>19</sup>, and about the role of bedrest in the therapeutic algorithm (well established therapy in the management of heart failure) clearly reflects in the answers provided by the respondents from both Atlanta and Zagreb. Only 10% of Atlanta respondents and none from Zagreb believe that therapeutic paracentesis requires bedrest for at least 24 hours. The fact that only 46.6% of Atlanta and 57.5% of Zagreb respondents consider strict aseptic technique to be *condicio sine qua non* of therapeutic paracentesis raises concern. In the study of Arroyo *et al.*<sup>20</sup> from 1991, one half of the respondents believed that ascites should be evacuated *in toto* in a single act of paracentesis, whereas in our survey only one Zagreb respondent (2.5%) shared their opinion. Moreover, 43.3% of Atlanta and 37.5% of Zagreb respondents considered that 4-6 liters of ascites should be evacuated *per* paracentesis, and as little as 17.5% of Zagreb respondents knew that therapeutic paracentesis should be followed by plasma volume expansion. The results of our study are consistent with those reported by Arroyo *et al.*<sup>20</sup> and Ascione and Burroughs<sup>21</sup>. Therapeutic paracentesis in liver cirrhosis is an established method of treatment. The technique used, performance conditions, amount of ascites removed, and need of plasma volume expansion are the factors that greatly contribute to the procedure efficacy and avoidance of postparacentesis circulatory dysfunction syndrome, which

obviously is not being adequately kept in mind in daily clinical practice. Recent studies demonstrating that sodium restriction and spironolactone reduce portal hypertension as efficiently as propranolol in patients with portal hypertension and no ascites<sup>22,23</sup> provide a rational basis for its prophylactic use, which was completely unknown to the physicians from either group in our survey.

In conclusion, it is necessary to reduce the time required for the clinicians adopt new knowledge about the efficacy of novel or established treatment protocols with modification in the indications or in the method and its timing. The fact that one half of the respondents from either group were ignorant of the century of birth of the author of the best known drawing in western civilization, which is often connected with medical literature, is indicative of the superficiality of our knowledge and the ease with which we handle time intervals of one hundred and more years. Vitruvius, a Roman architect, inspired Leonardo da Vinci with his text "De Architectura" to make the drawing named Vitruvian Man (~1492), a study of rationalization of geometry proportions and use of small numbers in creating a composition. The latest discoveries by mathematicians and art historians, as many as 500 years after the time the drawing was made, a drawing that does not only represent a study of human anatomy but a marvellous study of geometrical relations and mathematical series<sup>24</sup>, are a good example of how an old and well established knowledge needs critical revision and modification.

Table 5. Frequency analysis of correct answers according to sex

Question	Man (n=18)	Atlanta Woman (n=12)	p	Man (n=27)	Zagreb Woman (n=13)	p
	No. (%) of correct answers	No. (%) of correct answers		No. (%) of correct answers	No. (%) of correct answers	
Alcoholism is:	18 (100.0)	12 (100.0)	–	20 (74.1)	9 (69.2)	0.748
Alcohol-related liver cirrhosis is:	18 (100.0)	11 (91.7)	0.213	24 (88.9)	11 (84.6)	0.702
Correct concept of the pathophysiology of ascites formation is:	0	0	–	0	1 (7.7)	0.144
Cardiac output in liver cirrhosis is:	15 (83.3)	11 (91.7)	0.511	12 (44.4)	6 (46.2)	0.919
Leonardo da Vinci was born in:	9 (50.0)	7 (58.3)	0.654	10 (37.0)	10 (76.9)	0.018
In preascitic liver cirrhosis, in upright posture test aldosterone is:	18 (100.0)	10 (83.3)	0.073	19 (70.4)	7 (53.8)	0.305
Atrial natriuretic peptide, a hormone secreted by cardiac atria, causes:	7 (38.9)	6 (50.0)	0.547	18 (66.7)	6 (46.2)	0.215
Spironolactone, aldosterone antagonist, is used in cirrhosis in order to:	2 (11.1)	2 (16.7)	0.661	6 (22.2)	2 (15.4)	0.613
Therapeutic paracentesis of tense ascites in liver cirrhosis:	5 (27.8)	5 (41.7)	0.429	5 (18.5)	1 (7.7)	0.369

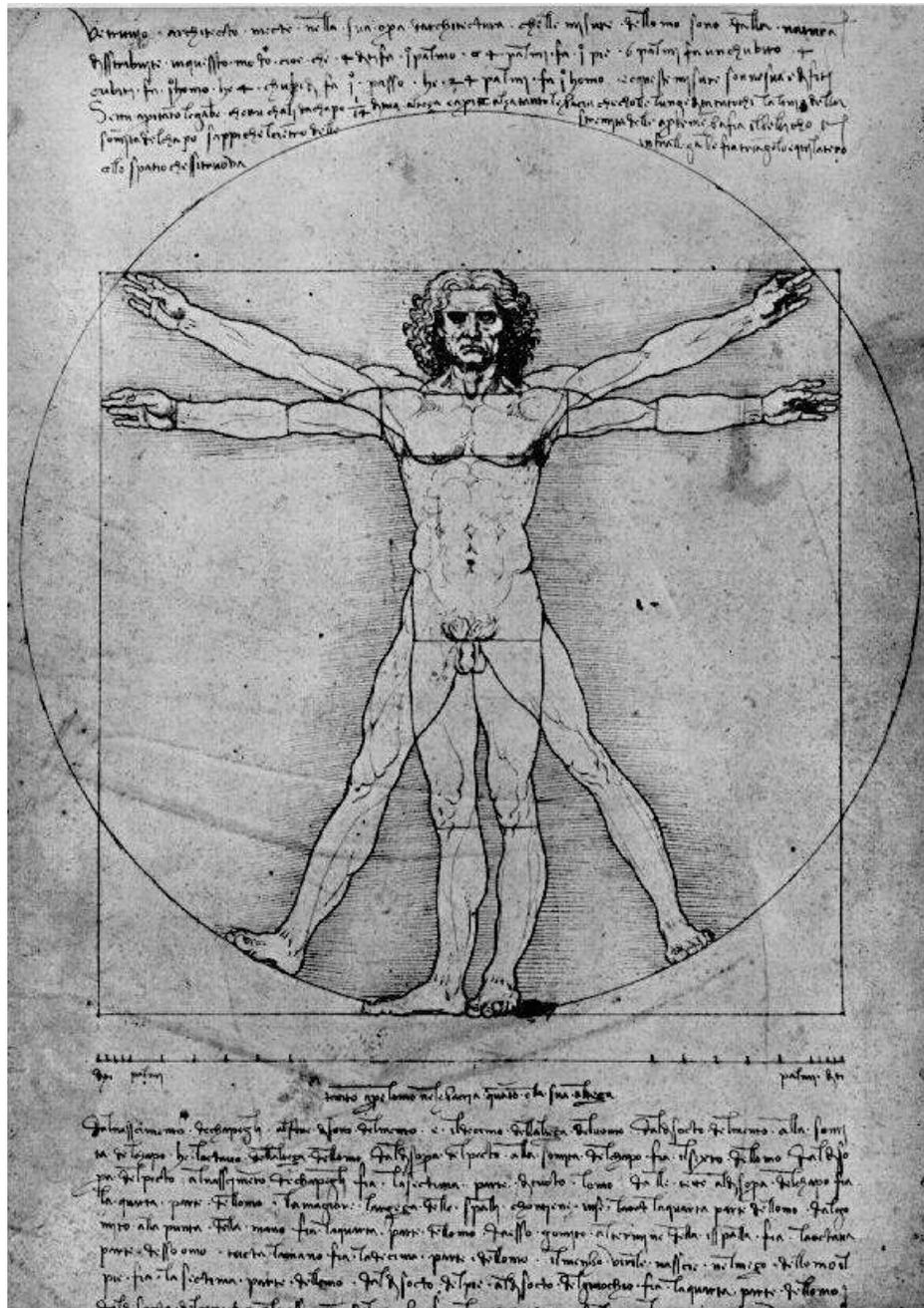


Figure 1. Vitruvian man; drawing by Leonardo da Vinci (c.1492), Gallerie dell' Accademia, Venice, Italy.

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## Sažetak

## UTJECAJ NOVIH SAZNAJ A I STAVOVA O BOLESTIMA NA TERAPIJSKO ODLUČIVANJE LIJEČNIKA

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Cilj studije bio je ispitati stav liječnika prema alkoholičarima i bolesnicima s alkoholnom bolešću jetre, te njihovo znanje o patofiziologiji i liječenju ascitesa u jetrenoj cirozi. Internisti i specijalizanti interne medicine su zamoljeni da ispune upitnik sastavljen od 14 pitanja o stavu prema alkoholizmu i alkoholnoj bolesti jetre, patofiziologiji nastanka ascitesa i njegovom liječenju. Istraživanje je provedeno u Klinikama za unutarnje bolesti Kliničke bolnice "Sestre milosrdnice" i Kliničkog bolničkog centra "Zagreb", Hrvatska (n=40) te Emory School of Medicine, Atlanta, Sjedinjene Američke Države (n=30). U skupini liječnika iz Zagreba bilo je statistički značajno više internista (p=0,025) i sa značajno dužim specijalističkim stažem (p=0,006). Značajna je bila razlika među skupinama u odgovorima na pitanja što je: alkoholizam (p=0,006), točna patofiziološka teorija nastanka ascitesa (p<0,001), minutni volumen u jetrenoj cirozi (p<0,001), plazmatska koncentracija aldosterona u testu stajanja u kompenziranoj jetrenoj cirozi (p=0,030), biološki učinak atrijskog natriuretičnog peptida (p<0,001), terapijski učinak spironolaktona (p=0,005) i paracenteza (p=0,009), kao i u učestalosti točnih odgovora na pitanja: alkoholizam je (p=0,002), minutni volumen u jetrenoj cirozi je (p=0,001), u kompenziranoj jetrenoj cirozi, u testu stajanja, aldosteron je (p=0,005) u korist skupine liječnika iz Atlante. Statistički značajno više liječnika iz Zagreba je znalo stoljeće rođenja Leonarda da Vincija (p=0,018). Zabilježili smo negativan stav prema alkoholičarima i bolesnicima s alkoholnom cirozom jetre u skupini liječnika iz Zagreba, te nedostatak znanja o patofiziološkim mehanizmima nastanka ascitesa i novim protokolima njegovog liječenja u objema skupinama. Liječnikov stav i znanje imaju utjecaja na terapijsko odlučivanje. Skraćeno vrijeme potrebno za prihvaćanje novih spoznaja o učinkovitosti novih ili etabliranih protokola liječenja s izmjenama u indikacijama ili načinu i vremenu primjene od strane praktičara je neophodno i proporcionalno je sa znanjem.

Ključne riječi: *Jetrena ciroza, liječenje; Jetrena ciroza, komplikacije; Ascites, etiologija; Ascites, prevencija i suzbijanje; Anka; Prikupljanje podataka*