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Health providers' knowledge on transfusion-transmitted viral hepatitis

ABSTRACT

OBJECTIVE: Training health providers is a strategy for improving health care quality that need to be technically correct and comply with the conceptual universe of the trainees. A pilot study was carried out to explore the consistency of knowledge on blood transmission of viral hepatitis among primary care providers.

METHODS: A non-identified questionnaire was applied to 190 providers attending a public health training program in 2003 and 2004. Answers were compared according to two groups: physicians, nurses and dentists (115 subjects) and other health providers (66 subjects). Frequencies of correct and incorrect answers were compared through Chi-square test (χ^2). Nine respondents did not inform their occupation.

RESULTS: The study population mainly comprised women (80%) aged 20 to 60 years from Northeastern (27.4%), Southeastern (35.3%), and Midwestern (37.3%) regions. Blood transfusion was associated with hepatitis B and C for 57.5% of the respondents; hemophilia was associated with hepatitis B and C for 55.7% of the respondents, while 74% considered to be incorrect the statement: "viral hepatitis cannot be transmitted through blood" and 16.4% considered it correct. The number of correct answers regarding blood transfusion was greater in the group of physicians, nurses and dentists than other providers (χ^2=1.2; p=0.2741).

CONCLUSIONS: These findings were compared with current data on viral hepatitis transmission and the consistency of the answers concerning different risk factors was evaluated. These providers' knowledge on blood transmission of these conditions shows inconsistencies that may jeopardize the effectiveness of prevention and control programs.

KEYWORDS: Hepatitis A, transmission. Hepatitis B, transmission. Hepatitis C, transmission. Information, analysis. Health personnel, education. Students, public health.

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INTRODUCTION

The vast literature on hepatitis evidences the progress of scientific knowledge on these syndromes. Despite experts' divergent opinions, defining the *technical* contents of training programs seems not to pose major difficulties. On the other hand, the *ancient* knowledge of societies on *epidemic jaundice* and *liver* references in theories on life and disease in the Western tradition make hepatitis concepts one of the most complex issues in the development of training programs for health providers. Jaundices were described in Hippocratic texts and Galeno (Jouanna)[7] deemed the liver – the first organ to be formed – the center of the three vital *pneuma*. The association between the liver and jaundice has been established and strengthened in the 20th century. However, the identification of viruses as etiologic agents of hepatitis and the development of laboratory testing for detecting these infections gave visibility to a group of hepatitis presenting no jaundice and either few or no symptoms.*

The forms of viral hepatitis are now highly concerning and severe health conditions worldwide.[8] In hemophiliacs, sickle cell and thalassemic patients, the different forms of post-transfusion hepatitis are one of their major co-morbidities and causes of death. The establishment of strict criteria for selecting donors, highly sensitive serological screening and processes for viral inactivation of blood products has led to reduced new cases of hepatitis but an increasing prevalence has been seen mostly due to diagnosis of old infections previously non-detectable.[9]

Hepatitis B and C have likely spread among hemophiliacs since 1962, when the first anti-hemophilic factor (factor VIII) concentrate was developed for hemophilia A. Advances have been made in the control of post-transfusion transmission after the introduction of donors screening for hepatitis B virus (HBV) in 1971, which became stricter in 1987, and the identification of antibodies against hepatitis C virus (anti-HCV) in 1990. Besides, the introduction of stricter clinical screening and industrial processes for viral inactivation after the emergence of HIV infection, and a safe and effective vaccine against hepatitis B in the mid-1980s represented significant advances in the prevention of viral hepatitis.**

With the prevention of hepatitis B and advances in AIDS treatment, hepatitis C virus (HCV) infection has emerged as a major co-morbidity in blood transfusion patients, especially those exposed to multiple blood and blood product transfusions.

Primary care providers' knowledge and practices should contribute to reduce the impact of the spread of these infections through actions towards health maintenance, such as hepatitis B vaccination of hemophiliacs, sickle cell, and thalassemic patients, chronic hepatitis C patients, HBV patients' sexual partners and home contacts. Although physicians providing care to these patients could advise them on the importance of vaccination, this advice is actually provided in primary care settings. Thus, health surveillance providers are required to have knowledge on these recommendations, making it possible for these populations to have timely access to this immune biological method.[3]

Following the recommendations of Alma-Ata Conference, health provider trainings are part of the essential strategies for assuring quality and adequate availability of basic health services.[11] In order to be effective, the proposed training should comply with the technical suitability of program contents and the conceptual universe of trainees.

Previous studies[3,5] have explored the knowledge of those professionals engaged in disseminating health information, such as elementary school teachers. It was found their knowledge on viral hepatitis was not enough to help promoting behavior changes among students, most of them in their teenage years, a period when they start engaging in risk behaviors.[5] Coppola et al[3] studied a group of primary care resident physicians and also verified gaps in their knowledge on hepatitis C.

The present study, conducted among public health providers attending a specialization course, sought to explore their knowledge on the prevention of the different forms of viral hepatitis. It is here presented the results of this pilot study that explored the consistency of knowledge of health providers working or intending to work in primary care on post-transfusion transmission of hepatitis B and C, and the relationship between blood transfusion as a risk factor and each form of viral hepatitis.

METHODS

The study was carried out in a convenience sample comprising trainees in a public health specialization course in the Northern, Northeastern, Southeastern, and Mid-Western regions of Brazil between 2003 and 2004. Most trainees were providers working or in-

*Freitas J. Hepatites víricas: perspectiva histórica. In: Cotter J, editor convidado. Hepatites víricas. Portugal: Núcleo de Gastrenterologia dos Hospitais Distritais; 2003. Disponível em http://www.aidsportugal.com/hepatites/9_35.pdf [acesso em 12 jul 2004]

**American Association of Blood Banks. Highlights of transfusion medicine history. Disponível em http://www.aabb.org/All_About_Blood/FAQs/aabb_faqs.htm#8. 2004 [acesso em 22 dez 2004]

Table 1 - Knowledge on the association between blood transfusion and each form of viral hepatitis according to occupational subgroups. Northern, Northeastern, Southeastern, and Mid-Western regions, 2003-2004.

Blood transfusion	Occupational groups*					p-value
	MED	MED (%)	OHP	OHP (%)	Unknown	
Associated to hepatitis B and C**	67	61.5	30	52.6	3	0.2741
Associated to hepatitis B or C***	23	21.1	18	31.6	4	
Associated to hepatitis B and/or C but also to hepatitis A***	16	14.7	7	12.3	1	
Associated to hepatitis A***	3	2.8	2	3.5	0	
Total	109	100.0	57	100.0	8	

MED: Medical providers; OHP: Other health providers
*16 (8.4%) subjects did not answer this item; **Correct answers; ***Incorrect answers

tending to work in collective health, particularly in the Brazilian Family Health Program (FHP).

Of 225 trainees, an anonymous voluntary questionnaire with closed questions was administered to 190 (84.5%) trainees attending the first class of the Health Programs module. Questions aimed at exploring providers' knowledge on transmission categories and prevention, risk factors and clinical progress, complications, severity and treatment of viral hepatitis.

The study sample was divided into two occupational subgroups with the purpose of assessing significant differences in knowledge between them. The first subgroup (MED) consisted of physicians, nurses, and dentists and the second one (OHP) of other health providers.

This is because it was chosen to group those occupations having similar basic knowledge on viral hepatitis transmission mechanisms and prevention. The first subgroup comprised the three categories of providers most exposed to occupational infection risk due to the nature of their interventions and procedures. The second group consisted of physical therapists, speech pathologists, nutritionists, psychologists, social workers who, due to the nature of their work, were less exposed to this risk.

For the purpose of this study, there were analyzed items on information and specific knowledge on post-transfusion transmission.

The frequencies of correct and incorrect answers in each subgroup were compared using the Chi-square test (Mantel-Haenszel). Epi Info Program 6.04d was used in the analysis.

The research was approved by the Research Ethics Committee of the Núcleo de Estudos de Saúde Coletiva of Universidade Federal do Rio de Janeiro, Brazil.

RESULTS

The questionnaire was answered by 190 trainees, aging from 22 to 60 years, mean age 33.5, median 31.5 and mode 26 years. Of them, 80% were females and 20% males; 32 (16.8%) were from the Northern region, 52 (27.4%) from Northeastern, 67 (35.3%) from Southeastern, and 39 (20.5%) from Mid-Western region.

In regard to occupational categories, the MED subgroup comprised 60.5% (115) of the study sample, 17 (8.9%) were physicians, 43 (22.6%) dentists, and 55 (28.9%) nurses. The OHP subgroup comprised 66 (34.7%) providers, as follows: pharmaceutical professionals (11), social workers (10), physical therapists (6), speech pathologists (5), psychologists (4), nutritionists (2), and others (28). Occupation was left blank (unknown) in nine questionnaires.

Table 1 shows the answers of 174 out of 190 subjects (91.6%) about their knowledge on the association of the risk factor "blood transfusion" and each form of viral hepatitis (8.4% left this item blank).

In regard to occupational subgroups (Table 1), in the MED subgroup (67%) blood transfusion was more often associated to hepatitis B and C than in the OHP subgroup (30%); however it was also more often associated to hepatitis A in the MED subgroup than in the OHP subgroup (60% versus 40%).

Of 167 (87.9%) providers who answered the item on the association between the risk factor "hemophilia" and each form of viral hepatitis, 93 (55.7%) associated hemophilia to hepatitis B and C, whereas 49 (29.3%) associated it to either hepatitis B or C, 19 (11.4%) also associated it to hepatitis A and 6 (3.6%) associated it to hepatitis A only (Table 2).

Providers in the MED subgroup associated hemophilia to hepatitis B and C more frequently than those in the OHP subgroup, as a whole (72% and 26.9%, respectively) and individually (51% versus 40.8%). Those in the MED subgroup also associated it more often to hepatitis A than those in the OHP subgroup, as a whole (52.6% versus 36.8%) and individually (66.7% versus 33.3%) (Table 2).

Table 2 - Knowledge on the association between hemophilia and each form of viral hepatitis according to occupational subgroups. Northern, Northeastern, Southeastern, and Mid-Western regions, 2003-2004.

Hemophilia	Occupational groups*					p-value
	MED	MED (%)	OHP	OHP (%)	Unknown	
Associated to hepatitis B and C**	67	63.2	25	46.3	1	0.0414
Associated to hepatitis B or C***	25	23.6	20	37.0	4	
Associated to hepatitis B and/or but also to hepatitis A***	10	9.4	7	13.0	2	
Associated to hepatitis A***	4	3.8	2	3.7	0	
Total	106	100.0	54	100.0	7	

*23 (12.1%) subjects did not answer this item
**Correct answers
***Incorrect answers

The item including the statement "The forms of viral hepatitis are not transmitted through blood transfusion nowadays" was answered by 177 (93.2%) of 190 subjects. Of them, 131 (74%) disagreed with the statement, 29 (16.4%) agreed and 17 (9.6%) stated they did not know. Among those who agreed with the statement, they were mostly in the MED subgroup (65.6%). Among those who disagreed with the statement, they were mostly in the MED subgroup as well, making up to 58.6% of the answers (Table 3).

Aiming at greater consistency of result interpretation, all answers were grouped in "correct" and "incorrect" categories and compared according to occupational subgroups (Tables 1, 2 and 3). A significant difference was found between the subgroups only regarding the question on the association between hemophilia and hepatitis B and C (χ^2=4.16 p=0.0414) (Table 2). For the remaining questions ("association between blood transfusion and hepatitis B and C" and "blood transfusion as a current source of viral hepatitis infection") (Tables 1 and 3, respectively), no statistically significant difference was found (χ^2=1.2 p=0.2741 and χ^2=2.06 p=0.1512, respectively).

The difference of knowledge suitability between the MED and OHP subgroups on the question examined in Table 2 shows that the former subgroup has most likely better knowledge on the association between hemophilia and hepatitis B and C than the OHP subgroup. Tables 1 and 3 show that the observed differences are most likely due to differences in the size of the MED (109 subjects in Table 1 and 111 in Table 2) and OHP subgroups (57 subjects in Table 1 and 58 in Table 2).

DISCUSSION

Although the convenience sample size of 190 subjects does not allow any statistical inferences, it allows to describing and exploring the knowledge suitability on the forms of viral hepatitis. It also provides an outline for further studies with greater sample consistency, by stratifying it according to age and occupational subgroups. Age distribution of the study sample, where 85% of the subjects aged up to 45 years, corresponds to the young profile of physicians in Brazil.[10] The same cannot be said on gender as most subjects were females, especially nurses, traditionally a female occupation.[13]

The predominance of physicians, dentists and nurses (MED group) over other health providers (OHP group) reflects the composition of health staff. According to the Brazilian Institute of Geography and Statistics' (IBGE) Medical Health Care Survey, they account for 82% of all university-graduated health providers in Brazil.* However, the physician-nurse ratio shows a prevalence of physicians, i.e., 8.1 physicians per nurse, as reported by Steagall-Gomes[13] for the Regional Health Department 6 of Ribeirão Preto (Southeastern Brazil). The higher proportion of nurses in the study sample is likely to be associated to their higher prevalence in public health.

Table 3 - Knowledge on transmission mechanisms of blood transmitted viral hepatitis according to occupational subgroups. Northern, Northeastern, Southeastern, and Mid-Western regions, 2003-2004.

Blood transfusion and viral hepatitis	Occupational groups*					p-value
	MED	MED (%)	OHP	OHP (%)	Unknown	
Disagreed**	86	77.5	39	67.2	6	0.1512
Agreed***	17	15.3	11	19.0	1	
Did not know***	8	7.2	8	13.8	1	
Total	111	100.0	58	100.0	8	

*13 (6.8%) subjects did not answer this item
**Correct answers
***Incorrect answers

*Ministério da Saúde/Datasus. Informações de saúde. Pesquisa assistência médico-sanitária 2002: Recursos humanos dos estabelecimentos. Disponível em http://tabnet.datasus.gov.br/cgi/deftohtm.exe?ams/cnv/namsrbr.def [acesso em 22 nov 2004]

Post-transfusion transmission of hepatitis B has been identified since the Second World War[2] and post-transfusion transmission of hepatitis C (formerly called hepatitis non-A non-B) has been identified since 1970s.[4] It is thus amazing to find that slightly more than half of the providers (57.5%) associated blood transfusion to hepatitis B and C. On the other hand, 12.6% of those who associated it to either hepatitis B or C or both also associated it to hepatitis A. It should though be stressed that hepatitis A is rarely transmitted through blood transfusion of coagulation factors. However, transmission through blood transfusion of total red cell and platelet concentrates, though theoretically possible, is unlikely as it would be necessary to draw blood from donors during a short viremia period (24 hours).

The association between hemophilia and hepatitis B and C reported by slightly more than half of the subjects (55.7%) – at a time when the prevalence of HBV exposure markers (HBsAg, anti-HBc and anti-HBs) among hemophiliacs was 77%[12] and 63.3% of Mid-Western hemophiliacs were HCV-infected[1] – suggested the need for better dissemination of this information.

The association between blood transfusion and hemophilia and hepatitis A was more frequently reported than expected, indicating poor dissemination of this information.[6] As this is an adverse transfusional event rarely identified in our setting, this association was most likely due to misidentification of the forms of hepatitis involved or to a random answer.

There was found a 74% disagreement regarding the statement "The forms of viral hepatitis are not transmitted through blood transfusion nowadays," suggesting that the study providers know that, despite improved control of blood quality, these diseases still can be transmitted through blood.

Yet 16.4% believed viral hepatitis cannot be transmitted through this route anymore. Of these, three were physicians, 10 nurses, and four dentists. Of 17 (8.9%) who mentioned not knowing whether this was or was not still possible nowadays, one was a physician, two were nurses and five were dentists.

In conclusion, though the majority of providers reported the most correct association between post-transfusion transmission (through blood and its components or through blood products) and the forms of viral hepatitis, it was found that a significant set of them are not sure on this issue as they answered either hepatitis B or C only and sometimes also hepatitis A.

Similarly, some providers, including those in the MED subgroup, were found to believe that post-transfusion transmission of viral hepatitis no longer occurs while others reported they did not know their current risk.

Despite the limitations of a convenience sample, the results of the present study show that the knowledge on viral hepatitis transmission is not enough suitable to ensure effective prevention and control programs.

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