Prevalence of HBV and HCV infections and high risk behavior for blood born infections among general population of Tbilisi, Georgia

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ABSTRACT

The viral hepatitis, first of all hepatitis B and C are among the major public health problems worldwide. An estimated 170 million people live with hepatitis C and 350 million with hepatitis B in the world. Hepatitis B and C are the main factors for development of end stage liver diseases, like chirosis and hepatocelular carcinoma. Even so that several studies have been completed in Georgia asessing the prevalence of HBV and HCV infections among the high risk behavior groups, like IDUs and blood donors, but the population based study was not conducted to get real estimates of the diseases' burden for the country. In 2002 a cross sectional investigation of 933 citizens of Tbilisi, Georgia was completed to measure the prevalence of HBV and HCV infections and identify the related risky behavior among them. HBc total was found among 11,4%, HBsAg in 1,7% of investigated population. HCV prevalence was 6,7%. Especially high prevalence of hepatitis B and C was found among the Injecting Drug Users (IDUs) with HBV prevalence of 66% and HCV prevalence 68%. Unsafe sexual practicies were also associated with HBV infection, 15,5% of study participants who reported unsafe sexual behavior were infected with hepatitis B virus and 8,5% with hepatitis C virus. Regarding the hystory of invasive medical procedures and prevalence of viral hepatitis, the following results were recieved: 14,7% of HBV infected and 9,2% of HCV infected people reported dental procedures as a risk factors for the infection, 11,5% and 7,7% had the history of sugeries, and 12% and 8% were relating their infection with gynecological procedures. The rate of blood transfussion associated viral infections was quite high before, but after implementation of the Safe Blood State Program an equal percentage of HBV and HCV infection (6,7%) was detected among the people with history of blood tranfusion.

KEYWORDS: *HCV, HBV, epidemiology, prevalence, high risk behavior*

The viral hepatitis, first of all hepatitis B and C are among the major public health problems worldwide. An estimated 170 million people live with hepatitis C and 350 million with hepatitis B in the world. Hepatitis B and C are the main factors for development of end stage liver diseases, like cirrhosis and hepatocelular carcinoma. Especially important is the hepatitis C problem that is characterized with chronic development in 80-85% of cases. In 20-40% of cases after 15-20 years from infection it causes end stage liver diseases. Hepatitis B is also an important health problem. Only in United States about 5000 people is dieing because of hepatitis B [1].

Even so that several studies have been completed in Georgia asessing the prevalence of HBV and HCV infections among the high risk behavior groups, like IDUs and blood donors, but the population based study was not conducted to get real estimates of the diseases' burden for the country. According to the study results, HBsAg prevalence was 8,7% and anti-HCV prevalence was 63,9% among IDU population [8]; among the blood donors the prevalence of HBsAg was 2,9%, and anti-HCV 7-8% [9,10].

METHODOLOGY

In 2002 a cross sectional investigation of citizens of Tbilisi, Georgia was completed to measure the prevalence of HBV and HCV infections and identify the related risky behavior among them.

At the first stage Tbilisi population estimation was done. The number of city residents was estimated at 1 112 000 people. The district's municipal units that keep the registry of Tbilisi residency were used as a study cites. In every district were randomly selected two units. At the last stage residents of the districts were selected 1174 people proportionally with the number of residents per district of the city. Extra number of persons was selected considering the possible refusal rates at 19-20%.

The selected individuals were visit at addresses of residence for blood sample collection and interviewing. 933 persons agreed to participate. Distribution of the study population by districts of Tbilisi is as follows: Vake-saburtalo 189 (20,3%); Didube-Chugureti -126 (13,5%); Gldani-nadzaladevi - 275 (29,5%); Mtatsminda-Krtsanisi -82 (8,7%) and Samgori-Isani -261 (28%) people.

LABORATORY INVESTIGATIONS

Blood specimens of the study participants were tested on hepatitis B and C markers useing the following laboratory tests:

- Screening with ELISA testing of blood serum for anti-HCV antibodies and HBsAg, HBc total antibodies;
- Confirmation on anti-HCV antibodies was completed with Recombinat Immunoblot Assay (RIBA)
- anti-HCV positive (RIBA reactive) samples were testing with qualitative PCR tests PCR) Hoffman La Roche)

STATISTICAL ANALYSIS

Based on the study questionnaire and lab testing results a research database was developed that was analysied in statistical software SPSS 11.0. Bivariate and mutivariate analysis were conducted to assess the assosiattion of the biomarker prevalence with risky behavior or history of invasive medical manipulations or blood transfusion reported.

RESULTS

Total of 933 people were participated in the survey, including 407 male and 526 females of 18-65 years of age.

HBc total was found among 11,4%, HBsAg in 1,7% of investigated population. The conformed HCV prevalence in entire cohort was 6,7%, also based on ELISA screening

anti-HCV antibodies were detected among 6,9% of the participants.

Especially high prevalence of hepatitis B and C was found among the Injecting Drug Users (IDUs). Total of 32 persons (3,4%) reported ever injecting of drugs. HBs Ag was detected in 6,3% and anti-HBc total in 66% of IDUs. HCV prevalence was 68% among this group.

Comperison of participants who reported and who didn't reported consistent condom use gave the following results (*Tab.1*):

Consistent condom use	HBsAg	HBc total	HCV
Yes	**3**	**18**	**11**
(163 people)	1.8%	11%	6.7%
No	**5**	**22**	**12**
(142 people)	3.5%	15.5%	8.5%

Tab.1 *Comperison of participants who reported and who didn't reported consistent condom use.*

Unsafe sexual practicies were also associated with HBV infection, 15,5% of study participants who reported unsafe sexual behavior were infected with hepatitis B virus and 8,5% with hepatitis C virus.

Regarding the history of invasive medical procedures and prevalence of viral hepatitis, the following results were received: 14,7% of HBV infected and 9,2% of HCV infected people reported dental procedures as a risk factors for the infection, 11,5% and 7,7% had the history of surgeries, and 12% and 8% were relating their infection with gynecological procedures (*Tab.2*).

Invasive Medical Manipulation	HBsAg	HBcor total	HCV
Dental	**15**	**74**	**46**
(502)	3%	14.7%	9.2%
Surgical	**1**	**6**	**4**
(52)	1.9%	11.5%	7.7%
Gynecological	**2**	**12**	**8**
(100)	2.0%	12.0%	8.0%

Tab.2 *Invasive medical procedures and prevalence of viral hepatitis.*

The rate of blood transfussion associated viral infections was quite high before, but after implementation of the Safe Blood State Program an equal percentage of HBV and HCV infection (6,7%) was detected among the people with history of blood tranfusion (*Tab.3*).

Transfussion of blood	HBsAg	HBcor total	HCV
Before 1998	**2**	**7**	**9**
(37)	5.4%	18.9%	24%
After 1998	-	**1**	**1**
(15)		6.7%	6.7%

Tab.3 *The rate of blood transfussion associated following viral infections.*

DISCUSSION AND CONCLUSIONS

The prevalence of both hepatitis B and C is higher in Georgia than in developed countries [1,15] and in many countries of central and eastern Aisia and Africa [2-7]. The epidemics are basiclly driven by injecting use of drugs due to high rates of shooting and drug preparation instruments sharing among IDUs. These data correspondts well with HBV and HCV prevalence data among IDU population in other countries of the central and Eastern Europe [13,14]. HCV/HBV Co-infection was found among 2,4% of the participants. As the study results suggest, unsafe sexual behavior is also an important risk factor for the B and C viral hepatitis transmission as 15,5% of people who reported never or inconsistent use of condoms were infected with HBV and 8,5% with HCV infection. The results of the study also indicates for high risk of nosocomial infection with hepatitis B and C virusis. 12,9-14,7% of investigated people were infected with hepatitis B and 8-9,2% with hepatitis C virus via invasive medical manipulations (dental, surgical, gynecological). A considerable reduction of blood transfussion associated HBV and HCV infections was detected within the study, namely, after implementation of Safe Blood Program HBV infection transmission rate was dicreased from 18,9% to 6,7% and HCV infection transmission was dicreased from 24% to 6,7% also.

The study results clearly indicate for urgent need of wide scale implementation of viral infections prevention interventions among high risk behavior groups, first of all among IDU population and commercial sex workers. The prevention of nosocomial infections within health care settings also needs immediate response through strict implementation and monitoring of universal precautions. The high burdent of viral hepatitis infections will require improved surveillance [19-21], planning and impelemntation of viral hepatitis clinical management interventions to address effectivly treatment needs of patients with chronic hepatitis B and/or C.

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Распространённость В и С вирусных гепатитов и риск передачи инфекции населению г. Тбилиси посредством крови

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Р Е З Ю М Е

Вирусные гепатиты, прежде всего типа В и С (HBV и HCV), представляют собой важнейшую проблему общественного здоровоохранения во всем мире, поскольку около 170 миллионов населения является насителем HBV и около 350 миллионов - с HCV. Эта инфекция представляет собой главную причину таких тяжелых поражений печени с необратимым исходом, как цирроз и гепатоцеллюлярная карцинома. В Грузии для оценки распространённости вирусных гепатитов В и С среди групп высокого риска (наркоманы, доноры крови) проводилмсь ряд исследований. Однако, для составления реальной картины об эпидемиологической ситуации необходимо изучить превалентность этих заболеваний. Нами в 2002 году обследовано 933 жителей города Тбилиси на выявление инфицированности HBV и HCV с целью определения распространённости среди них поведения высокого риска. HBC total выявлен у 11,4%, HBsAg - у 1,7% обследованных лиц. Превалентность HCV составила 6,7%. Особенно высокая превалентность вирусных гепатитов обнаружена у лиц, употреблющих наркотики интравенно, среди которых превалентность HBV составили 66%, а HCV - 68%. В группе лиц, практикующих рискованное сексуальное поведение, превалентность HBV составила 15,5%, HCV – 8,5%. При оценке связи инвазивных медицинских манипулляций с инфицированием HBV и HCV, установлено, что среди лиц, подвергшихся стоматологическим манипулляциям, превалентность HBV составляета 14,7%, HCV – 9,2%. Среди лиц, подвергшихся хирургическому лечению маркеры HBV и HCV оказались позитивными, соответственно 11,5% и 7,7%. Среди женщин, подвергшихся гинекологическим манипулляциям эти показатели оказались равными 12% и 8% соответственно. Превалентность HBV и HCV среди реципиентов крови гепатитов составила 6,7%.

Ключевые слова: *В и С гепатиты, эпидемиология, превалентность, поведение высокого риска*