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Research Article

FAECO-ORALLY TRANSMITTED VIRAL HEPATITIS: A CROSS-SECTIONAL INSIGHT INTO KNOWLEDGE AND PRACTICES OF YOUNG MALES

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A B S T R A C T

Background: Studies regarding awareness and practices for preventing faeco-orally transmitted viral hepatitis are lacking in the country. An exhaustive study was conducted among young armed forces trainees to assess knowledge and practices regarding Hepatitis A and E.
Methods: A cross-sectional, multi-centric study was carried out on 4175 trainees of armed forces trainees at eleven country wide training centres of armed forces. Sampling was done using multistage random sampling method.
Results: Awareness of transmission of hepatitis A and E through contaminated water and food was 35.81% and 26.78% respectively. Jaundice as symptom of hepatitis A and E was known to only 15.30% study subjects. 97.60% and 93.41% study participants were washing hands after toilet use and before food consumption. However, only 28.99% study participants were practicing hand washing as per WHO guidelines. The study also revealed consumption of items incriminated in transmission of viral hepatitis like *Chat-papri/golgappa/bhelpuri* (65.72%), cut fruit/salads (60.70%), local ice-creams (28.14%) by study participants.
Conclusion: Low levels of knowledge and practices mandates formulating strategies to increase awareness and practices related to prevention of hepatitis A and E.

INTRODUCTION

Hepatitis A and Hepatitis E viruses are the faeco-orally transmitted agents of acute viral hepatitis. Worldwide, Hepatitis A virus (HAV) infection accounts for 1.4 million cases annually[1]. Estimated number of cases of HAV in Asian countries ranges from 10 to 30 per 100,000 population per year. Exact incidence of Hepatitis E virus (HEV) is unknown[2]. Outbreaks of HEV are common in parts of world with hot climates but rare in temperate climates. In India, epidemics of HAV have occurred in different parts of the country. One such epidemic occurred in Delhi in 1955[3], two in Kerala in 1998 and 2004[4,5] mainly affecting the young adults and recently one has been reported from Shimla[6]. HEV is also self limiting and clinically indistinguishable from other hepatitis infections. Disease affects mainly young adults between the ages of 15–45 yrs with reportedly increased mortality of about 20-25% among pregnant women[7]. In developing countries like India, highest incidence of viral hepatitis is seen in teenagers and young adults[8]. The adolescents and young adults comprise a major proportion of the country's population and commonly indulge in behaviour considered high-risk for hepatitis. India has the largest population of adolescents and young adults in the world; 362 million individuals, aged between 10-24 years constituting 28% of the country's population[9]. It is vital that their awareness, risk insights and practices be evaluated in order to

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implement appropriate preventive strategies. Studies have been conducted earlier to assess awareness[10,11&12] and to assess level of knowledge among medical students, university students and healthcare workers (HCW) of India largely regarding Hepatitis B and C, however Hepatitis A and E have not been studied adequately. Thus, the available literature lacks studies on awareness and practices for prevention of feaco-orally transmitted hepatitis among young adult males. This study was therefore carried out to assess awareness levels and practices among young armed forces trainees across the country.

MATERIAL AND METHODS

A multi-centric cross sectional survey was conducted in years 2010 and 2011 amongst healthy young adults of eleven training centres, selected by multistage random sampling, giving equal representation to all regions of India. The purpose and methodology of the study was explained to all study participants and informed consent was obtained. Pretested questionnaire was used to collect data on demographic profile and various risk factors associated with Hepatitis A and E infection. The participants were asked to answer regarding their practices before joining the training centre. The filled questionnaire and the blood sample of each study participant was coded to relate the results of ELISA later for data entry and analysis. In addition to this, blood samples were also collected for estimating the prevalence of antibodies to HAV and HEV amongst the study population. The detailed methodology and results of that have been published earlier [13.] Sample size was calculated for each centre taking seroprevalence for Hepatitis A as 60%, with alpha 5% and sample size worked out to be 369 (370) with a total sample size for eleven centres as 4070. Adding 5% for refusals, a total of 4275 participants were included. However, 06 (0.14%) participants in one of the centres gave a probable history of Hep A vaccination and 94 (4.13) were excluded either due to refusal to be part of the study (21) or filling up questionnaire but not providing blood sample (73).

Table 1 Awareness levels of HAV & HEV transmission & symptoms among study participants

Characteristic	Frequency (%)
Perception of Study Participants regarding Awareness about Spread of Hepatitis A & E	
Aware	2381 (57.03)
Awareness regarding spread of Hepatitis A and E by contaminated water	
Yes	1495 (35.81)
Awareness regarding spread of Hepatitis A and E by contaminated food	
Yes	1118 (26.78)
Awareness among Study Participants regarding different Symptoms of Hepatitis A & E	
Fever	868 (20.79)
Malaise	590 (14.13)
Abdominal pain	385 (9.22)
Vomiting	374 (8.96)
Loose motions	240 (5.75)
Jaundice	639 (15.30)
Loss of appetite	589 (14.11)
Dark coloured urine	532 (12.74)
Yellowish discolouration of eyes	695 (16.65)
Availability of Hepatitis A vaccine	
Yes	1934 (46.32)
No	631 (15.11)
Don't know	1610 (38.57)

A total of 4175 participants were included in the study. As per available literature on KAP regarding Hep A and E, considering 70% knowledge and alpha 5% sample size of 323 was adequate for each centre. Study participants within each centre were chosen by simple random sampling. A data base was created in MS Excel and was analysed using SPSS ver 14.0.

RESULTS

The seroprevalence, age profile and other demographic parameters have already been published earlier[13]. The perception of study participants on awareness about transmission of HAV and HEV is described in Table-1.

Table 2 Water supply and Faecal disposal among study participants

Characteristic	Frequency (%)
Source of Drinking Water	
Piped Water	
Private Tap	1973 (22.50)
Community Tap	836 (9.54)
Surface Water	
River	853 (9.73)
Stream	863 (9.84)
Ground water	
Well	1619 (18.47)
Hand Pump	1459 (16.64)
Tube well	1164 (13.28)
Total	**8767* (100)**
Drinking water storage	
Syntax Tank	
Covered	816 (19.54)
Uncovered	0
Cleaned once in 1 month	636
Cleaned once in 2 months	138
Cleaned once in ≥ 3 months	42
Household Containers	
Covered	3165 (75.80)
Uncovered	194 (4.66)
Cleaned Daily	1818
Cleaned once in two days	1492
Cleaned once in three days or more	49
Drinking water treatment	
Boiling	2013 (48.21)
Household purifier	375 (8.98)
Household filtration	175 (4.19)
Household alum use	142 (3.40)
Household settling down	44 (1.05)
Solar disinfection	267 (6.40)
Other methods	21(0.05)
No treatment	1138 (27.72)
Latrine	
Flush Type	1729 (41.41)
Pour Flush Type	700 (16.77)
Ventilated Pit type	182 (4.36)
Composting Pit type	158 (3.78)
Open Pit type	126 (3.01)
Slab Covered Pit type	146 (3.50)
Hanging type	78 (1.87)
Others	204 (4.88)
No latrine	852 (20.42)
Method of Disposal of Child faeces	
Child used latrine	722 (17.29)
Put into latrine	881 (21.10)
Put into garbage or drain	424 (10.16)
Left in open	413 (9.89)
Not aware / No children < 3yrs of age in family	1735 (41.56)
Method of Final Disposal of faeces	
Sewage System	558 (13.36)
Septic Tank	1218 (29.17)
Composting Pit	481 (11.52)
Open defecation	852 (20.41)
Unaware	1066 (25.54)

The awareness levels regarding spread of HAV and HEV was low compared to their perception on awareness regarding spread (57.03% vs 35.81%). The responses regarding awareness of symptoms of HAV and HEV also showed low levels of awareness. The common symptoms known to study participants were fever (20.79%), yellowish discolouration of eyes (16.65%) and jaundice (15.30%). Majority (53.68%) of the study participants were unaware of availability of vaccine against HAV.

The practices of observing water, food and personal hygiene are important in preventing HAV and HEV related viral hepatitis. The water supply, its treatment and disposal of faeces are major determinant of transmission of HAV and HEV. The source of water supply and its treatment is described in Table-2.

The hand washing practices among study participants were assessed. Majority of the study participants reported hand washing after toilet use and before food consumption (97.60% and 93.41% respectively). The in depth analysis of practices of hand washing showed soap and water as the commonest material used (76.12%), scrubbing of all parts of hands was practiced by majority (63.21%) of the study subjects and scrubbing duration of >20 seconds among 49.53% study participants. However, further analysis of hand washing practices based on World Health Organisation guidelines revealed satisfactory hand washing practices in only 28.99% of the study participants. The detailed hand washing practices are described in Table-3.

Table 3 Hand washing practices among study participants

Characteristic	Frequency (%)
Hand washing after toilet use	
Yes	3791(97.60)
No	100 (2.40)
Hand washing before food consumption	
Yes	3900 (93.41)
No	275 (6.59)
Materials used for Hand washing	
Soap and Water	3178 (76.12)
Only Water	348 (8.33)
Ash and water	137 (3.28)
Soil and water	91 (2.18)
Others	12 (0.29)
Did not answer	409 (9.80)
Scrubbing of parts of hands	
Scrubbing of all parts	2639 (63.21)
Only Scrubbing of Palms	388 (9.29)
Scrubbing of only web spaces	55 (1.32)
Scrubbing of only nails	33 (0.79)
Scrubbing of only back of hands	45 (1.08)
No scrubbing	345 (8.26)
Did not answer	670 (16.05)
Duration of Scrubbing of hands	
<20 seconds	681 (16.31)
20 seconds	943 (22.59)
20-40 seconds	1452 (34.78)
>40 seconds	616 (14.75)
Did not answer	483 (11.57)
Hand washing Practices	
Satisfactory	1210 (28.99)
Unsatisfactory	2965 (71.01)

The consumption of unhygienic foods transmits faeco-orally transmitted viral hepatitis. The food hygiene practices revealed consumption of freshly prepared food by 92.69% study subjects. Major concerns while consuming food outside house were covering of food (55.80%), presence of flies (54.16%) and serving of freshly prepared food (39.40%). The study participants confirmed of practice of consuming *Chat-papri/golgappa/bhelpuri* (65.72%), cut fruit/salads (60.70%), local ice-creams (28.14%) and other items incriminated in transmission of viral hepatitis. The practices are illustrated in Table – 4.

Table 4 Food practices among study participants

Characteristic	Frequency (%)
Covering of Cooked Food	
Yes	3667 (87.83)
Consumption of Freshly prepared Food	
Yes	3870 (92.69)
Hygiene factors checked by study participants before consuming food at places other than the house	
Hygiene of place	1456 (34.87)
Presence of Flies	2261 (54.16)
Food covering	2330 (55.80)
Food handler uses gloves, cap & apron	1047 (39.40)
Food served is freshly prepared	1645 (39.40)
Waste food material disposal	623 (14.92)
Hand washing facilities	1311 (31.40)
Nuisance of animals	756 (18.11)
Total	**11429***
Food items commonly consumed by study participants at places other than house	
Sea foods (except shellfish)	593 (14.20%)
Raw unwashed vegetables / Unwashed fruits / Salads / Cut fruit in open on *thelas*	2526 (60.50%)
Sandwiches	645 (15.45%)
Golgappas / Chat-Papri / Bhelpuri	2744 (65.72)
Local Ice creams – *Thelewala*	1175 (28.14)
Total	**7585***
Source of milk supply	
Dairy	2488 (59.59)
Packaged milk	433 (10.37)
Not aware	1254 (30.04)
Boiling of milk before consumption	
Yes	3465 (82.99)
No	324 (7.76)
Not aware	386 (9.24)
Consumption of milk directly from udder of cattle	
Yes	1108 (26.54)

DISCUSSION

Viral hepatitis in addition to causing substantial morbidity and mortality also has adverse economic consequences. In an Armed Forces study, conducted in a tertiary care hospital with study individuals mainly being army trainees, HAV and HEV have been found to be responsible for 33% and 45.4% cases respectively amongst hepatitis patients[14]. Possibility of explosive outbreaks of viral HAV and HEV cannot be ruled out in armed forces due to contamination of drinking water with faecal matter or sewage either due to operational requirements or corroded and old pipelines in old cantonments. Awareness about modes of transmission is the mainstay of prevention. In our study, only 35.81% study subjects believed HAV and HEV to be transmitted by contaminated food and water and these awareness levels were quite lowin comparison to 71.09% college students in Bangalore[15]. However, study conducted in Iran has shown quite low scores regarding awareness transmission of HAV and HEV[16]. Knowledge about symptoms of viral hepatitis was very less in our study as in the study in Iran. The lack of formal school based health education in our country might have led to lower awareness of diseases like hepatitis. Knowledge of HAV vaccine availability in the present study

was almost similar to study amongst college students in Bangalore (46.32% vs 47.66%).

In the present study, a higher proportion (64.88%) of the study participants were using piped water supply in comparison to 43% as per NFHS-III[17]. Amongst those having piped water supply, 69.13% were having household water connection in our study compared to 65.11% as per NFHS-III[17]. The community tap was being utilized by 30.87% in our study compared to 34.89% according to NFHS-III[17]. As per NFHS-III, about 12% people are using well as a source of water supply in comparison to about 41.13% in our study. The wide variation in our study compared to NFHS-III can be attributed to the multiple response option provided in our study compared to single response option in NFHS-III as well as possible socio-economic development in the gap of 4-5 years between our study and NFHS-III. According to a study on household water treatment in low and middle income countries[18] , 34.4% households in India perform some type of treatment on water before consumption while in our study the household water treatment was performed by a much larger proportion (72.74%) of the study participants. Boiling of water was the commonest method of treatment used by the households in our study as well as in the study mentioned. Similar to findings of the study[18] other methods used in our study were household purifiers, filtration, solar disinfection, alum, chlorine tablets or solution and household settling down. Among military populations the operationally deployed are at an increased risk of acquiring faeco-orally transmitted hepatitis. Chlorination is the method in vogue for water disinfection in armed forces and breakdown in the system has led to outbreaks in the past. The awareness and practice of chlorination needs to be emphasized for preventing sporadic cases as well as outbreaks of HAV and HEV.

Improper disposal of faeces and cross contamination of water pipelines from sewage pipelines are major causes of HAV and HEV transmission during outbreaks. In our study, higher proportions (79.59%) of the study participants were having access to toilet facility as compared to 44.7% as per NFHS-III[17]. The flush or pour flush type was the commonest type of toilet used by study participants in accordance with findings of NFHS-III. The other types of latrines used by study participants were also similar to NFHS-III as ventilated pit type, slab covered pit type, open pit type, composting pit type etc. In the present study, among 17.29% families of study participants, children were using latrine and this was higher compared to 12% as per NFHS-III[17], 21.10% were putting it in toilet compared to 9% according to NFHS-III[17]. Thus in our study, the total disposal of child faeces in the toilets, either child used latrine or disposal by mother was 38.39% and lesser than a study conducted in Burkina Faso[19] wherein about 63% disposal was in toilets. A lesser proportion (10.16%) in present study were throwing it in garbage as compared to 26% as per NFHS-III[17]and only 9.89% were leaving it in open compared to larger proportion in a study in Dum Dum, Kolkata[20] and also 44% according to NFHS-III[17]. This large variation could have been due to the different educational status and better economic condition of the study participants in our study and the same is not mentioned amongst participants of the Kolkata study[20] and NFHS-III[17]. Sewage system for final disposal of faeces was 13.35% in our study and extremely lower in comparison to the world scenario of 31% population living in houses connected to sewer[21]. More than 25% of the study participants being unaware of the final disposal facility may have lead to this wide variation from the world scenario and other existing national figures. Septic tank connected latrines were used by about 29.17% study participants in our study. This study finding is in contrast to the findings of NFHS-III[17].

Hand washing after toilet use was being practiced by 97.60% of the study participants in our study which is in accordance with findings of study by Ray SK etal[22] of 99% and 98% of hand washing practices by two different communities of eastern part of India. Hand washing before food consumption was also practiced by 93.41% of our study participants, but in the study mentioned earlier[22] it was comparatively low at 78% and 39% in two different communities. The hand washing practices were similar in all the training centres studied. Soap and water was commonly used material (76.12%) for hand washing in our study and is comparable to the 73.18% by mothers in South India[23]. These findings are in stark contrast to only 28.79% proportion of school children using soap and water for hand washing in Kolkota[24]. Scrubbing of hands upto duration of 20 seconds or more was being practiced by majority (72.12%) of the study participants in our study and comparatively higher than 11% in the study in two eastern communities[22]. This large difference might have been due to better educational background of the study participants of our study where the minimum educational qualification was 10th standard whereas the same has not been described in the study mentioned[22].

CONCLUSION

The findings of our study have highlighted a huge gap in the knowledge and practices regarding prevention of viral hepatitis. However, the knowledge and practices are better than the national and local studies. The gravity of the disease mandates direct need for enhancing the knowledge of young adults; and it can be achieved by incorporating mandatory literature in their syllabus. Strategies need to be developed to create awareness on hygienic practices like sterilisation of water, hand washing, consumption of hygienic food etc. High disease burden of hepatitis and its related complications in India warrants the need to set-up hepatitis registries and formulation of government supported prevention and control strategies.

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