PREVALENCE OF HEPATITIS A IN MANSEHRA CITY DUE TO CONSUMPTION OF TAP WATER

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ABSTRACT

This paper covers the aspect of introduction of water borne diseases along with high focus on hepatitis A, its prevalence and causative agents. The incidences of water borne diseases increase when any disturbance occurs in water supply and its drainage system. Water supply through unprotected streams, ponds and some sort of lakes increases the prevalence of water borne disease hepatitis A and this situation is common in all developing countries. The water borne diseases include Diarrhea, Typhoid fever, Giardiasis, Shigellosis, Acute Gastroenteritis, Poliomyelitis, Amebiasis, Dracunculosis, Hepatitis A, Hepatitis E, and Cholera. Bacteria, viruses, protozoa and helminthes are causative microorganisms of water borne diseases. These diseases are not only result of drinking of contaminated water but also its prevalence is seen in swimming pools suggesting that use of contaminated water for other purposes than drinking can also cause food borne diseases. Hepatitis A, a communicable disease is transmitting rapidly from one to another. The purpose of this research study is to estimate the prevalence of water borne disease Hepatitis A, in Mansehra city due to consumption of tap water. So, this research may persuade the other researchers to take action to prevent this disease by identifying the causative agents and situations and making interventions accordingly. Interview based data collection system is used from houses and blood samples of cooperating members are collcted. Data from hospital labortary is also collected to analyze the prevalence of HAV. Proper questionnaires were prepared to conduct interview and collect data at interview spot along with blood sample. The report of this research shows that prevalence of hepatitis A is high at home level. Among hospitalized patients again hepatitis A has high prevalence. Most affected population is children less than 15 years old age group but limited data of children is collected due to their absence from home.

KEYWORDS: Diarrhea, Typhoid fever, Giardiasis, Shigellosis and etc.

INTRODUCTION

Water borne diseases are the group of illness caused by ingestion of microorganisms mixed in water. The drinking of contaminated water leads to water borne diseases. These contaminants can be dirt or pollutants from environment, human or animal feces, chemicals or any other pathogenic microorganisms mixed in water. To prevent the incidence of the water borne diseases, maintenance and improvement of water sanitary system including provision and waste disposal of water is important along with food sanitation. Several researches are conducted to trace the causes of water contamination and it is concluded that any accidental breakage in sanitation such as back siphonage, inadequate water chlorination, cross-connections, surface pollution, defective well casings, and ruptured sewage all contribute in water contamination that leads to incidence of water borne diseases (I. H. BORTS, 1949).

The major causes of mortality and morbidity in worldwide are identified the water and food borne diseases. It is reported that in developing countries mainly in rural areas water is supplied through unprotected streams, ponds and some sort of lakes, hence the chances of contaminations are high in these types of water supply. That is why mostly incidence of water borne diseases is considered in these developing areas. Diarrhea, Typhoid fever, Giardiasis, Shigellosis, Acute Gastroenteritis, Poliomyelitis, Amebiasis, Dracunculosis, Hepatitis A, Hepatitis E, and Cholera are water borne diseases affecting all age groups but mostly younger age when immune system is not fully developed. Escherichia coli, Shigella species, Salmonella typhi, Paratyphi and Vibrio cholera are common bacteria causing water borne diseases. Polio virus, Enteroviruses, Rota virus, and noroviruse are common causative viruses of these diseases. Entameoba hystolitica and Giardia lamblia are common protozoa causing these diseases. Some helminthes including Dracunculus medinesis also cause these diseases. (Melake Demena, 2003).

The significant cause of water borne diseases is considered viruses. To document all the viruses along with their causative diseases is a difficult challenging task due to unavailability of the detections methods for viruses. Also their wide range of variety has made the research in this field very limited. The single largest cause of outbreak of water borne diseases is identified the noroviruses affecting 45% of population. The affecting rate of various other viruses is also investigated and it is reported that adenovirus has 24%, echovirus has 18%, hepatitis A virus has 7% and coxsackieviruses have affected 5% of population. But drinking

contaminated water is not only cause of prevalence of these diseases, it is investigated that the half of the outbreaks occurred are due to swimming pools. 49% of outbreaks spread through swimming pools while the second largest outbreak occurred in lakes or ponds. 40% infection rate is considered through lakes and ponds (Gerba, 2009).

Hepatitis A is a viral disease of liver caused by hepatitis A virus HAV. It is communicable disease from one person to another. It is an acute infection that doesn't worsen the liver condition and is cured by itself with passage of time. After entering in the body, virus has an incubation period ranging from 2 to 7 weeks, after incubation symptoms of hepatitis A appears. So this disease cannot be diagnosed in early onset. Also this disease is limited in its symptoms, symptoms can be observed in older age people, and children under less than 6 years do not have symptoms of hepatitis A. By having close interaction with hepatitis A person you are at risk of 95% to get transmitted by HAV. This disease cures by itself within a period of six months. The HAV IgM antibody test is used to diagnose hepatitis A at laboratorial scale. This antibody is produced by body immune system when HAV enters in body. The presence of these antibodies in blood indicates the HAV presence in body (V.Yates, 2014).

The purpose of this research study is to estimate the prevalence of water borne disease Hepatitis A in Mansehra city due to consumption of tap water. So, this research may persuade the other researchers to take action to prevent the incidence of these water borne diseases especially hepatitis A, by identifying the causative agents and situations (tap water or contaminated water), and making interventions accordingly.

METHODOLOGY

Systematic review study design is used to investigate the prevalence of water borne disease hepatitis A in Peshawar city (Lamberts, 30 November 2006). A proper Questionnaire including sequence wise questions to be asked is prepared to be filled at the interview spot. So that the suffering patients along with their food diary could be reported to estimate the main cause of illness either the tap water or close relation with patient of Hepatitis A. Particular interview timings were decided to interview the residents of Mansehra area at their home to determine their views that either they consider the tap a cause of hepatitis A or not. The female headed household was targeted for interview conduction to provide the whole family information as well as household chores to be done by her including eating habits. The

blood samples of cooperating candidates were collected to detect the HAV IgM in their blood.

Quota sampling technique is used to investigate the prevalence of hepatitis A in Peshawar city (Cris Beauchemin, 2011). A list of almost 10 areas of Mansehra city was prepared to be visited daily. These areas include Abbottabad road, Baidara road, Chaikah road, Mufti road, Mohalla Jabri, Kashmir road, Mohalla saienabad, Mohalla DUB 1, Mohalla Noghazi and Mohalla Jabri. Direct interview from families was conducted to estimate their information level regarding this illness. Mostly patients were found at homes situated in backward areas of developing countries having contaminated water supply. Because these areas are not well developed and do not have educated population to take care of themselves by using filtered or boiled water.

Inclusion criteria

The house headed female having age 18 to 60 years were interviewed for this research study. The family members having age less than 50 years were included in the data of this research study. Data of children more than 1 year was considered for this research study.

Exclusion criteria

The house headed female over 60 years were not interviewed. The family members over age 50 years were also excluded for this research study. Data of children under 12 year was also excluded from this research study. Families having house headed females under age 16 were also excluded. People who were not native of Mansehra or had any difficulty in understanding the native language were also excluded from this research study.

Data collection from residences

Name of female headed household:					
Address:					
Contact No:					
	Name of Member	**Age**	**Gender**	**Occupation**	**Any Health Complaint**	
Source of water used for drinking purpose:					

| Any procedure to be used for water cleaning/sanitation: |
| Source of water used for cooking purposes: |
| Source of water used for bathing purposes: |
| Source of water used for cleaning purposes: |
| Any family member diagnosed with hepatitis A: |

The laboratory of King Abdullah Hospital of Mansehra city was also visited after collecting data from residents to estimate the trends of self-care. Water source to be used before onset of hepatitis A were also investigated. The current water source to be used during HAV attack was also reported in data collection procedure.

Data collection from laboratory of king Abdullah Hospital

Patient's Name	Age	Gender	Occupation	Diagnosis

RESULTS

The total houses to be interviewed were 248. So, 248 house headed female were interviewed. And blood samples of total 792 people were collected for detection of HAV IgM. 702 candidates were more than 16 years old including 564 females and 138 males. Least data of male candidates was collected due to their absence in home in day timings. Remaining 90 candidates were children ranging from 10 to 15 years including 53 females and 37 males.

People whose blood sample was collected

Disease	Total patients	Fe (children)	M (children)	Fe (old age)	M (old age)
Hepatitis A	792	53 (10 - 15 y)	37 (10 – 15 y)	564 ($\geq$ 16 y)	138 ($\geq$ 16 y)

Patients detected with HAV

Disease	Total patients	Fe (children)	M (children)	Fe (old age)	M (old age)
Hepatitis A	486	44 (10 - 15 y)	18 (10 – 15 y)	325 ($\geq$ 16 y)	99 ($\geq$ 16 y)

The data collected from laboratory of King Abdullah Hospital of Mansehra city includes 42 patients detected with HAV along with other health conditions. 29 patients out of 42 were old age ranging from 16 to 50 years and remaining 13 patients were children ranging from 10 to 15 years.

Patients with HAV found in laboratory of King Abdullah Hospital of Mansehra city

Disease	Total patients	Fe (children)	M (children)	Fe (old age)	M (old age)
Hepatitis A	42	11 (10 - 15 y)	2 (10 – 15 y)	19 (≥ 16 y)	10 (≥ 16 y)

CONCLUSION

The report of this research shows that prevalence of hepatitis A is high at home level. Mostly patients were found at homes situated in backward areas of developing countries having contaminated water supply. Because these areas are not well developed and do not have educated population to take care of themselves by using filtered or boiled water. Most affected population is children of 10 to 15 years old age group. The maximum data of children was not collected because mostly children were at schooling place during data collection timings. Population of Mansehra and its targeted area were unfamiliar of this disease. They didn't know that water borne diseases occur as a result of consumption of contaminated water. Among hospitalized patients again hepatitis A has high prevalence with other health conditions. It is reported that even the patients diagnosed with HAV and their care givers are not suggested to prevent the use of unclean water. Lack of knowledge is observed in the population of Mansehra city including the areas of Abbottabad road, Baidara road, Chaikah road, Mufti road, Mohalla Jabri, Kashmir road, Mohalla saienabad, Mohalla DUB 1, Mohalla Noghazi and Mohalla Jabri. Several intervention strategies are needed to spread awareness and take actions at home level rather than making efforts to provide safe and clean water sanitation system. Additionally, water drainage system needs a lot of amendments.

This research study is limited because data on small scale is collected; a big data collection program is not implemented to collect data for this research study. Also in addition to this, the report of this research only shows limited prevalence of hepatitis A because of lack of cooperation of people for providing blood samples foe detection of HAV IgM. The point at which water is contaminated with HAV is also not identified. Additionally no intervention is implemented to guide the people along with the prevention of this water borne disease hepatitis A. The immigrants in Mansehra are also not interviewed. Population of Mansehra having age group more than 50 years and less than 10 years is also not considered for this research study. Additionally, the Mansehra population having house headed females under age 16 years due to any tragedy are also not considered for this research study. No experienced interviewer or psychologist was hired to conduct interview to relax the target

audience to share the authentic data to avoid the extent of wrong estimate of prevalence of this water borne disease hepatitis A. schools were not visited to collect data from children to estimate the prevalence of hepatitis A among school going children because water provided to children at school places is also not purified.

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