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Original Research Article

Investigation of an outbreak of jaundice in a rural area of District Srinagar in Kashmir

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ABSTRACT

Background: A team of doctors visited the Gasoo area of Batpora on 20-02-2020 to investigate the suspected outbreak of jaundice.
Objectives: 1. To verify the occurrence of an outbreak of jaundice, 2. To identify etiology of this outbreak and 3.To identify the population affected.
Materials and Methods: Two teams started from the center of village in two opposite directions and undertook house to house survey. Any person having the history of one or more of 5 symptoms/signs: yellowish discoloration of eyes or body, pain abdomen, vomiting, fever or history of hospitalization within past 1 month was considered for inclusion into investigation. Blood samples were taken for hepatitis serology.
Results: A total of 16 cases were examined with 9 of them males. History of Yellowish discoloration of eyes or body was the most common symptom (87%) followed by fever (81%). Mean Serum bilirubin was 3.4 mg/dl. Hepatitis A serology was positive in 7 cases out of 8 tested cases while as hepatitis B and C serology was negative in all the tested cases.
Discussion: As there was clustering of cases of jaundice in the area clearly in excess of expected, so the outbreak of Juandice was confirmed. The time, place and person distribution of jaundice pointed towards a water-borne hepatitis which was confirmed by laboratory tests to be Hepatitis A outbreak. Most commonly affected age group was 10 to 15 years.
Conclusion: An outbreak of jaundice was confirmed and it was found to be due to Hepatitis A Virus.

1. Introduction

Disease outbreaks occur very frequently. While Centre for Disease Control in United States of America recorded more than 500 outbreaks of food-borne illnesses alone each year during the 1990s, recognized outbreaks of respiratory and other diseases are also common. There are many more outbreaks which go undetected. [1]

"Epidemic is defined as the occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time. Usually, the cases are presumed to have a common cause or to be related to one another in some way. Outbreak: when the epidemic is limited to localized increase in the incidence of disease it is referred to as an outbreak. Cluster: aggregation of cases in a given area over a particular period without regard to whether the number of cases is more than expected or not." [2]

Hepatitis is a general term referring to inflammation of the liver. It can result from many causes, both infectious (i.e, viral, bacterial, fungal, and parasitic organisms) and noninfectious (e.g, alcohol, drugs, autoimmune diseases, and metabolic diseases). Those viruses that primarily affect

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the liver are called hepatitis viruses. There are several types of hepatitis viruses including types A, B, C, D, E, and possibly G. Types A, B, and C are the most common. Acute viral hepatitis is diffuse liver inflammation caused by specific hepatotropic viruses that have diverse modes of transmission and epidemiologies. Viral hepatitis is responsible for more than 50% of cases of acute hepatitis in the United States. It is most commonly caused by hepatitis A virus (HAV), hepatitis B virus (HBV), and hepatitis C virus (HCV). These three viruses can all result in acute liver disease presenting with symptoms of nausea, abdominal pain, fatigue, malaise, and jaundice.[3]

Hepatitis A is always an acute, short-term disease. On the contrary hepatitis B, C, and D are more likely to be for long term periods and become chronic. Hepatitis E is usually an acute infection but it can be very dangerous in pregnant women.

Hepatitis A and Hepatitis E are waterborne diseases. These are caused by hepatitis A virus (HAV) and hepatitis E virus (HEV) respectively. These viruses mainly grow in areas where sanitation is poor and typically result from ingesting fecal matter that contaminates the water supplies. Hepatitis B, C and D are par-enteral and are transmitted through contact with infectious body fluids, such as blood, vaginal secretions, or semen, containing such viruses. Injection drug use, having sex with an infected partner, or sharing blades and razors with an infected person increase the risk of getting hepatitis B,C or D.[4]

Gasoo village of Batpora area is located to the north-east of Srinagar around 18 kms from the city center Lal-chowk. It falls under the medical zone Zadibal, Srinagar and is catered by Primary Health Centre Burzahama. The population of this village is 1110 with a total no of 227 households. It included 587 males and 523 females with a sex ratio of 891 females per thousand males. Adult population of the area is 798 and the number of children below 15yrs of age is 312. There is also an ISM (Indian System of Medicine) dispensary located within the village. The temperature during winter months ranges from -5 to +12.

As per the information a suspected outbreak of jaundice was reported in Gasoo area of Batpora and a team visited the area for investigation of the epidemic.

2. Objectives

1. To verify the occurrence of an outbreak of jaundice in Gasoo area of Batpora in District Srinagar.
2. To identify etiology of outbreak of jaundice in Gasoo area of Batpora in District Srinagar.
3. To identify the population affected by the outbreak of jaundice in Gasoo area of Batpora in District Srinagar.

3. Materials and Methods

The department of Community Medicine Government Medical College Srinagar received a communication from BMO Hazratbal on 19-02-2020 regarding the presence of a suspected outbreak of jaundice in Gasoo area of Batpora. Upon the direction of Head of Department, Community Medicine Government Medical College Srinagar, a team of doctors visited the area on 20-02-2020 to investigate the suspected outbreak of jaundice. As per the local health authorities no such outbreak had happened during the past 3 years during the same season. A health camp was conducted on 16.02.2020 under the directions of Chief Medical Officer Srinagar by a team of doctors and para-medicals in which blood samples for hepatitis serology were taken. Also, environmental samples (water samples) were taken for analysis from the source as well as at domestic level.

The investigating team met the health authorities at PHC Burzahama and enquired regarding the affected area, where from an ASHA accompanied the team to identify the affected locality. The team reached the Mohalla Banipora of village Gasoo where local community members were contacted. Two teams started from the center of village near Jamia Masjid Mahreeb in two opposite directions and undertook house to house survey. Any person having the history of one or more of 5 symptoms/signs: yellowish discolouration of eyes or body, pain abdomen, vomiting, fever or history of hospitalization within past one month was considered for inclusion into investigation. The cases were interviewed and examined by the team and all medical records pertaining to the current disease were checked. Some of the cases had already done some laboratory tests which were also noted down. Their demographic variables were noted down. Five blood samples were taken for hepatitis serology. The team also interviewed local community members regarding source of water to the community and assessed the drainage of the locality.

4. Results

A total of 16 cases were interviewed and examined in detail. Out of these 9 were males and 7 were females.

Table 1: Distribution of cases according to age group

Age group(years)	Frequency	%Age
4-6	3	18
7-9	1	6
10-12	5	29
13-15	6	35
>=16	1	6
Total	16	100

Most commonly affected age group was 5-15 yrs with an overall mean age of 11.3 yrs.

The most common symptom was History of Yellowish discoloration of eyes or body followed by Fever.

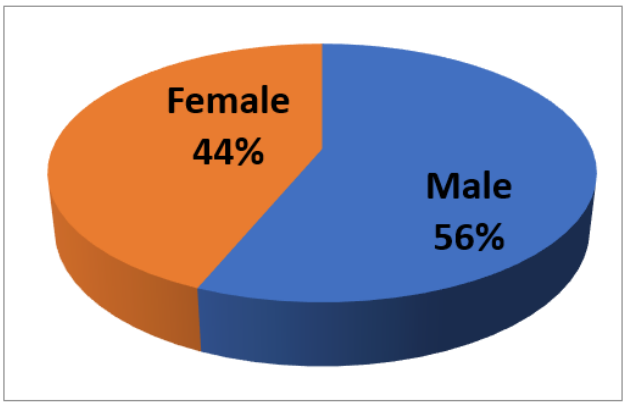

Fig. 1: Distribution of cases according to gender

Table 2: Distribution of frequency of symptoms/signs and their percentage

S. No	Symptom/Signs	Frequency	%age
1.	History of Yellowish discoloration of eyes or body	14	87
2.	Fever	13	81
3.	Pain abdomen	12	75
4.	Vomiting	10	62

Table 3: Reports of Serology tests already done before visit

Serology	Positive	Negative
Hepatitis A	3	0
Hepatitis B	0	4
Hepatitis C	0	2

Table 4: Liver function tests already done before visit

Total cases	Tests done	Mean Serum bilirubin (mg/dl)	Mean SGOT(U/L)	Mean SGPT(U/L)
16	13	3.4	793.2	944.4

Table 5: Serology report of samples taken during visit (N=5)

S.No	Serology	Positive	Negative
1.	Hepatitis A	4	1
2.	Hepatitis B	0	5
3.	Hepatitis C	0	5
4.	Hepatitis E	0	5

5. Discussion

A total of 16 cases were interviewed and examined out of whom 9 were males and 7 were females. Mean serum bilirubin was 3.4 mg/dl and liver enzymes were raised. Most commonly affected age group was 5-15 yrs with mean age of 11yrs. The most common symptom was History of Yellowish discoloration of eyes or body which was present in 14 cases followed by fever (13 cases), pain abdomen (12 cases) and vomiting (10 cases). Hepatitis A serology was positive in 7 cases and negative in 1 case while as all other serology reports (Hepatitis B & C) were negative.

As there was clustering of cases of jaundice in the Gasso area of Batpora clearly in excess of expected number when compared with previous 3 years, so the outbreak of Juandice was confirmed. The mean serum bilirubin was 3.4 mg/dl and liver enzymes were raised in majority of cases, which further confirms the existance of the outbreak.

The time, place and person distribution of jaundice pointed towards a water-borne hepatitis which was confirmed by laboratory tests. Out of 8 serology tests for hepatitis A, 7 were positive and one was negative. The negative test belonged to a 40-year-old person who had a serum bilirubin of 2.2 mg/dl and might be suffering from some non-infective (surgical) cause of jaundice. Thus, the etiology of outbreak of jaundice was confirmed to be Hepatitis A. Also serological tests were done for hepatitis B and C, all of them were negative; further strengthening the confirmation of Hepatitis A outbreak.

Most commonly affected age group was 5-15 yrs (64%) with mean age of 11yrs. The males were more commonly affected as compared to females. These features are in consistence with a diagnosis of Hepatitis A outbreak.

6. Conclusion

An outbreak of jaundice reported in Gasoo area of Batpora is confirmed. A hypothesis was generated that it is an outbreak of waterborne infective Hepatitis which was later confirmed by Hepatitis serology of cases as Hepatitis A outbreak. Most commonly affected age group was 5-15 yrs with mean age of 11yrs. There was almost similar gender distribution of outbreak. The most common symptom was yellowish discoloration of eyes followed by abdominal pain and fever. The community members available there were given health education regarding prevention of water-borne diseases.

7. Recommendations

1. Health education about importance and technique of hand washing shall be given to the population by health authorities and also to be stressed in congregational prayers by local Imams.
2. Roll boiling of drinking water for at least 10-15 minutes shall be stressed upon to the community.
3. As water samples for analysis were already taken by team from CMO Srinagar, they shall be followed and appropriate measures taken after receiving the reports of water analysis.

A report of investigation of an outbreak of suspected jaundice in Gasso area of Batpora was formulated and submitted to Head of Department, Community Medicine

Government Medical College Srinagar. It was also shared with Principal/Dean, Government Medical College, Srinagar for information and Chief Medical Officer Srinagar for information and necessary action.

8. Source of Funding

None.

9. Conflict of Interest

None.

10. Acknowledgement

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