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Comparison between Death Due to Hepatic Coma in Hepatitis A and Hepatitis B Viruses in The Population of Mosul City (Iraq)

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ABSTRACT

Background: Viral hepatitis is highly infectious disease with non-specific prodromal illness characterized by headache, myalgia, arthralgia, nausea, and anorexia usually precedes the development of jaundice by a few days to two weeks, vomiting and diarrhea may follow, and abdominal discomfort is common. Dark urine and pale stools may precedes jaundice; the liver is often tender but only minimally enlarged. Occasional splenomegaly and cervical lymphadenopathy are seen.

Objective: To estimate the frequency of death due to hepatic coma in hepatitis A virus and hepatitis B virus among population in Mosul City (Iraq).

Methods: A prospective study was carried out on (32) death cases of hepatic coma of different ages and sexes where admitted in Alshiffa Hospital of chest and infectious diseases in Mosul city (Iraq) between 1st January on 1999 to the end of December on 2018.

Result: Death due to hepatic coma in hepatitis A virus is more common than hepatitis B virus, the percentage of hepatitis A (68.75%) (22 from the total 32 patients) and hepatitis B virus (31.25%) (10 from the total 32 patients).

Conclusion: Although hepatitis A virus is less severe than hepatitis B virus and had lower chronicity and complications but can cause acute liver failure and fulminant disaster which lead to death if not protection was done to the all people especially children and adolescents who were more prone for exposure.

Keywords: Hepatitis A virus (HAV), Hepatitis B virus (HBV), ALT (Alanine Aminotransferase, IST (Aspartate Aminotransferase, IG (Immunoglobulin).

INTRODUCTION

Hepatitis A virus (HAV) is RNA virus belongs to the picornavirus group of enterovirus, HAV is highly infectious and is spread by faecal-oral routes. In united states, 30-40 % of adult population has evidence of HAV infection [1], virtually all previously healthy patients with HAV recovered completely with no clinical sequelae, similarly in acute HBV (95-99%) of previously healthy adults have a favorable course and recover completely [1,2,3]. Infected individuals with HAV who may be asymptomatic, excrete the virus in faeces for about (2-3 weeks) before the onset of symptoms and then for a further two weeks or so on. Infection is common in children but often asymptomatic, and so up to 30% of adults will have serological evidence of past infection but give no history of jaundice, infection is more common in areas of overcrowding and poor sanitation. In occasional outbreaks, water and shellfish have been the vehicle of transmission, in contrast to HBV chronic carrier state does not occur [2]. Incubation period (2- 6 weeks) with a prodromal symptoms include fever, myalgia, arthralgia, nausea and anorexia, jaundice develops ± hepatomegaly, splenomegaly, and adenopathy.

In HAV, AST and ALT rise (22-40) folds after exposure and usually return to normal over 5-20 weeks [4]. IgM rises from day (25) and signifies recent infection, IgG remains detectable for life [1,3,4]. There is no special therapy for HAV but can be treated with supportive measures[1,2,3,4,5], infection in the community is best prevented by improving social conditions, especially overcrowding and poor sanitation. Acute liver failure is rare in HAV (0.1%) and chronic infection does not occur [1,2,3,4,]. Although most patients achieve full recovery, two distinct complications can occur (1- acute liver failure),

those at risk for this complications are adolescents and adults. But also patients with underline liver disorder or those who are immune-compromised, the second complications, HAV can progress to a prolonged cholestasis syndrome that waxes and wanes over several months[3], HAV are contagious for two weeks before and nearly seven days after the onset of jaundice and should be excluded from school [3]. HAV can be prevented by Immunoglobulin (IG) 0.02 ml/kg intramuscularly (I.M) administration includes pre-exposure and post-exposure prophylaxis [3]. IG is recommended for pre-exposure prophylaxis for susceptible travelers to countries where HAV is endemic and it provides effective protection for up to 3 months [3].HAV vaccine can be given any time before travels but is preferred for pre-exposure prophylaxis in healthy persons, but IG ensures and appropriate prophylaxis in children less than one year of age.

If travel is planned in less than two weeks older patients, immunocompromised hosts, and those with chronic liver disease or other medical condition should receive both IG and HAV vaccine, IG as prophylaxis in post-exposure situation should be used as soon as possible (Not effective more than two weeks after exposure it is exclusively used for children less than twelfth months of age, immunocompromised hosts those with chronic liver disease or in-home vaccine is contraindicated [3], IG is preferably used in patients more than 40 years of age, IG is optional in healthy persons (12 months – 40 years). In-home HAV vaccine is preferred and alternative approach is to immunize previously unvaccinated patients who are ≥ 12 months. At the age-appropriate vaccine doses as soon as possible IG is not routinely recommended for sporadic nonhousehold exposure (e.g. protection of hospital personnel or schoolmates) [1,3].

Advisory committee on immunization practices of the USA public health service recommended routine HAV vaccination for all children all vaccines give IM in the deltoid area. The vaccine is approved for children more ≥ 1 year of age. They are administered IM in a 2- doses schedule, with a second dose given 6-12 months after the first dose. Seroconversion rate in children exceed 90% after initial dose and approach 100% after second dose, protective antibody titer persist at least for ten years[1,3].

Hepatitis B virus is a DNA virus spread by blood products; IV drugs abusers, sexual intercourse and direct contact. The incubation period (1-6 months), the signs resemble HAV but extrahepatic features are more common (e.g. Arthralgia, Urticaria), it is diagnosed by finding HBsAg (surface antigen) which present (1- 6 months) after exposure. The presence of HBsAg more than 6 months defines carrier status and occur in (5-10%), its complication is fulminant hepatic failure (rare), relapse, relapse prolonged cholestasis, chronic hepatitis, coagulopathy, encephalopathy, cerebral oedema more common in HBV than HAV [3], there is no specific treatment for HBV but can be prevented by hepatitis B vaccine, this vaccine is protective measure and can produce active immunization in (95%) of normal individuals. Indication and dosing schedule for HBV vaccine is shown in (Table 1).

Table 1: Schedule of HBV Vaccine [1]

Target group	Number of dose	Dose	Schedule, months
Infant, children(< 1 – 10 years)	3	0.5 ml	0, 1-2 , 4-6
Adolescent(11 – 19 years)	3 or 4 or	0.5 ml	0- 2, 1- 4, 4-6 or 0, 12, 24 or 0, 1, 2, 12
Adults ≥ 20 years	2	1 ml	0 , 4-6 (age 11- 15)
Hemodialysis patients	3	1ml	0-2 , 1 -4 , 4-6
< 20 years	3	0.5 ml	0 , 1, 6
≥ 20 years	3	0.4 ml	0, 1, 6

Also, vaccination should be given to high-risk group like parenteral drug users, patients on chronic hemodialysis, patients with chronic liver disease, medical nursing and laboratory personnel, men who have sex with men, newborn of infected mothers, regular sexual partners.

Hepatitis B immunoglobulin is indicated only for specific post-exposure prophylaxis circumstances and provide only temporary protection (3-6 months) [3].

METHODS AND MATERIALS

A prospective study was done on (32) dead cases reported in Alshiffaa hospital for chest and infectious diseases (Mosul City in Iraq) of different ages and sexes from the first of January 1999 to the end of December 2018, the death is due to hepatic coma which is a complication of both HAV and HBV, all the patients before death (were examined thoroughly by clinical examination and biochemical and serological test, and they had hepatitis either HAV or HBV. (Table 2) reveals the cause of death due to hepatic coma in both HAV and HBV. "Fig. 1" reveals the frequency of death due to hepatic coma in HAV in comparison to the HBV among populations who attend Al-Shiffaa Hospital for chest and infectious diseases (Mosul City, Iraq).

Table 2: The cause of death due to hepatic coma in both HAV and HBV.

Year	Less than 1 year		1-4 years		5- 9 years		10 -14 years		15-19 years		20 -44 years		45- 64 years		65 years and more		Vaccination Status
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1999	1			1				1									No
2000	1		1										1				No
2001				1													No
2002				1		1											No
2003			1									1					No
2004			1	1	1												No
2005																	
2006																	
2007															1		No
2008							1										No
2009																	
2010			1														No
2011															1		No
2012															1		No
2013			3	1													No
2014				1													No
2015				1			1	1		1	1						No
2016					1												No
2017																	
2018														2			No

Red color = Number of death cases due to hepatic coma related to HAV (22 from the total number 32) with the percentage (68.75%)

Blue color = Number of death cases due to hepatic coma related to HBV (10 from the total number 32) with the percentage (31.2 5%)

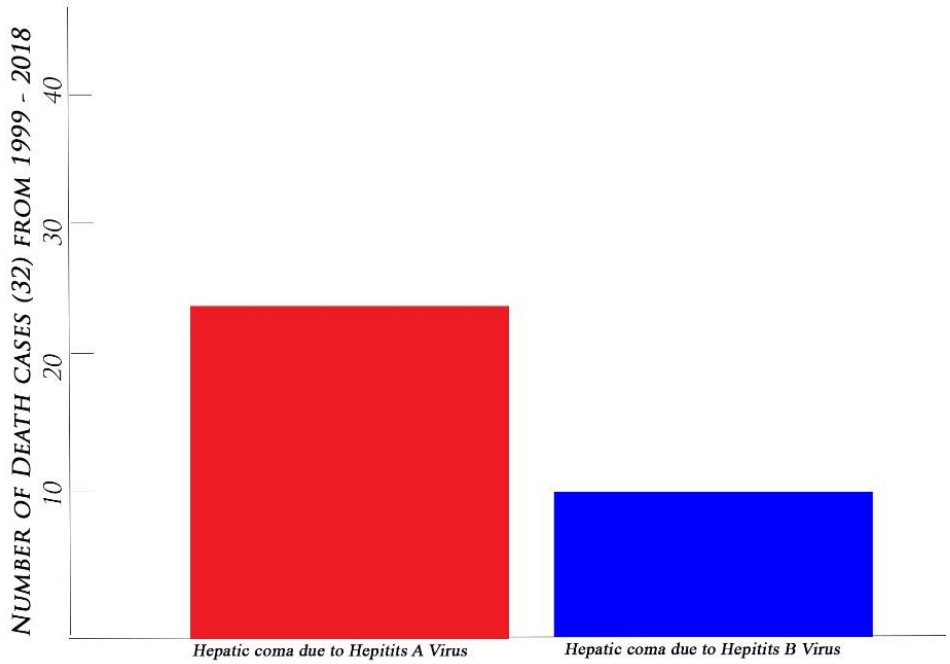

Figure 1: shows the distribution of hepatic coma in HAV and HBV

RESULTS

The results of the study reveals that frequency of death due to hepatic coma is more common in children and adolescents and adults of both sexes and it is more common in HAV (22) cases from the total number (32) cases (68.75%) while the number of death cases due to hepatic coma in HBV was (10) from the total number (32) cases (31.25%).

DISCUSSION

Although HAV is less severe than HBV and it has less complications but if not controlled by prevention of both passive and active immunization it will be run to fulminant hepatitis leading to coma and probably death.Also, this study shows that the cause of death due to hepatic coma in HAV is more common than HBV, probably because the vaccine for HAV is not available in the hospitals and health centers in Mosul city, Iraq as availability of vaccine for HBV which is present in all hospitals and health centers in Mosul city.

CONCLUSION

As long as HAV is not controlled very well by both (passive and active immunization) as HBV, so that it sometimes run to a very severe course of illness leading to fulminant hepatitis and acute liver failure and death.

RECOMMENDATIONS

- HAV should be prevented in population before exposure by active immunization as mentioned in the schedules.
- Passive immunization (IG) should be given pre-exposure and post-exposure to all people who are susceptible to infection like travelers to countries where HAV is endemic, close contacts of HAV infected patients, the elderly those with measure diseases and perhaps pregnant woman.
- All preventive measures should be done for HBV (passive and active immunizations) as mentioned above in the schedule.
- All the hospitals and health centers in Mosul city should be provided with vaccine and IG for HAV as it available for HBV.
- Further studies should be done in other hospitals for the same subject.

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