



Outbreak of Epidemic Jaundice Caused by Hepatitis A virus in Bani Walid City 2017-2018

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Abstract:

Hepatitis A and E viruses infections are one of the pandemic infections in Africa. The study's objective is to identify and count the incidence of jaundice during an epidemic period in Bani Walid City.

Data were collected using a structural questionnaire for all cases that were infected with epidemic jaundice in Central Bani Walid Hospital during a period from October (2017) to January (2018). According to recorded data, the etiology of all 68 jaundice cases is hepatitis A virus. Nearly the rates of affected males and females cases. The most affected age groups were 10-19 years. The levels of bilirubin were ranged from 1.5-3.0. The incidence of infected cases increased in Nov and Dec 2017 and declined in January

Keywords: Jaundice, Epidemic, Hepatitis A virus, Bilirubin.

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تفشي وباء اليرقان الناجم عن فيروس التهاب الكبد الوبائي أ بمدينة بني وليد 2017-2018

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قسم المختبرات الطبية، كلية التقنية الطبية، جامعة بني وليد، بني وليد، ليبيا

الملخص

تعد عدوى فيروسات التهاب الكبد A و E إحدى حالات العدوى الوبائية في أفريقيا. كان الهدف من هذه الدراسة حصر حالات الإصابة باليرقان (الفيروسي) خلال فترة انتشار الوباء بشكل كبير وسريع في مدينة بني وليد. حيث تم جمع البيانات للحالات المصابة بمستشفى بني وليد المركزي خلال الفترة من أكتوبر (2017) إلى يناير (2018). وفقاً للبيانات المسجلة، فإن مسببات جميع حالات اليرقان البالغ عددها 68 حالة هي ب فيروس أ. كانت معدلات الإصابة متقاربة في الجنسين الذكور والإناث. أما عن الفئات العمرية الأكثر تأثراً هي 10-19 سنة. تراوحت مستويات البيليروبين بين 1.5-3.0. كانت حالات الإصابة في ذروتها في نوفمبر وديسمبر 2017 وانخفضت في يناير.

الكلمات المفتاحية: اليرقان، الوباء، فيروس التهاب الكبد أ، البيليروبين

Introduction

The word Jaundice means 'yellow' which derivative of French word 'Jaune' [1]. Jaundice is characterized by hyperbilirubinemia and high levels of bilirubin may be in conjugated or unconjugated

type. The symptoms of jaundice appear when bilirubin levels are more than 34.2 $\mu\text{mol/L}$ or 2 mg/dL [2]. The bilirubin is produced from heme group. The heme is catabolized at alpha carbon bridge by an enzyme heme oxygenase and results in the liberation of iron, carbon monoxide and biliverdin. The biliverdin is further acted upon by biliverdin reductase to form bilirubin [3]. 80 % of bilirubin is derived from the heme group of haemoglobin. This haemoglobin comes from the destruction of red blood cells in the reticuloendothelium of the liver, spleen and bone marrow. The remaining 20% of bilirubin comes from multiple sources like myoglobin, cytochromes etc (1, 4). 3.8 mg/kg or approximately 250-300 mg bilirubin is produced daily in normal adults [5, 6].

Jaundice in adult patients may occur by many diseases with variations in severity. Patients with jaundice must early diagnosis of the cause of jaundice and proper initial intervention to be made [7]. Jaundice in patients in Intensive care units is common and may reach 40%, and high mortality [8]. The breakdown of blood and liver dysfunction in patients with trauma are causes of jaundice due to hyper bilirubin levels [9].

Conjugation of bilirubin takes place in the liver by UDP-glucuronosyltransferase (UGT) and this conjugation is essential for water solubility and elimination (1, 4). The activity of UDP-glucuronosyltransferase is influenced by age, gender, thyroid hormones and microsomal enzyme-inducing agents, such as phenobarbital, rifampicin etc. [10, 11].

Hepatitis A is one of the most common viral hepatitis infections worldwide [13,14]. In developing countries, such as Eastern Europe, parts of Africa, Asia and America, due to low hygienic sanitary, the rates of infection are high in later childhood or young adulthood. The spread of infection from person to person is common among children in childcare centers and schools besides to food-borne epidemics [12]. There are middle rates of anti-HAV seroprevalence in North Africa. Morocco and Algeria had high immunity rates (100%) in children (by age 10 years) and adults. In general, the infection levels in rural than urban areas [15-17].

This study aimed to determine and count the infected cases with jaundice during an epidemic period that occurred in Bani Walid City. Also, to detect the risk factors of jaundice (age and Sex-specific HAV).

Material and methods

This is a descriptive cross-sectional study of the incidence and outbreak of epidemic jaundice (HAV) in Bani Waleed city, Libya. The study was carried out during the jaundice epidemic period that began in Oct 2017 and dropped off in Jan 2018.

Data were collected using a structural questionnaire for all cases that were infected with epidemic jaundice in Central Bani Walid Hospital during a period from October (2017) to January (2018). The questionnaire includes the age and sex of the patient, etiology of jaundice and total bilirubin levels (mg/dl).

The statistical analyses were performed using SPSS (Statistical Package Social Sciences).

Results and discussion

The present study included 68 jaundice cases collected from Medical records of Central Bani walid Hospital. According to this data the etiology of all of 68 jaundice cases is virus A hepatitis .

The distribution of cases of epidemic jaundice by sex is shown in Figure 1. In this study, relatively equivalent rates of affected males and females were noted, at 49.28% and 50.72%, respectively. Males were more predominant than females with ratio as 1.4 in a study population reported by Le Ngoc Hung 2015 [18], similar to that from study of Whitehead NW 2001 (ratio 1.47) [19] , and lower than that of Yu Z, 2012 (ratio 1.9) [20].

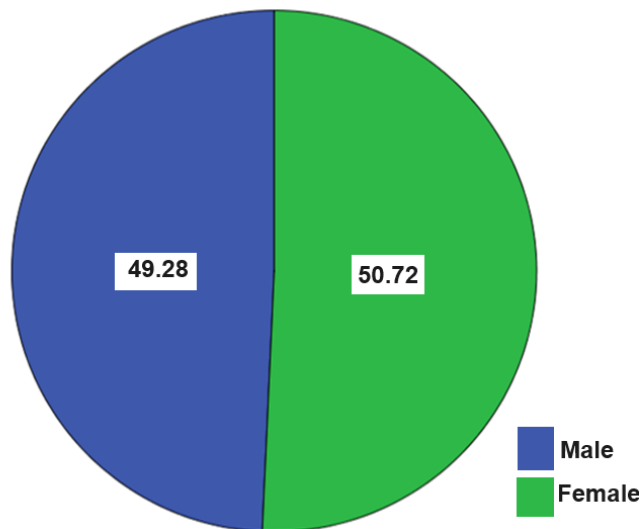


Figure 1: Distribution of epidemic jaundice cases according to sex.

The infection of children is low in good sanitation countries and hygienic conditions; however, adolescents and young adults often have the highest rates of infection. Large community-wide epidemics with prolonged person-to-person transmission can still have a large impact on the burden of hepatitis A infection. Additionally, food borne or waterborne epidemics can occur in childcare centres or residential institutions [21].

According to the age risk factor and according to the age criteria, no incidences of infection were found in people older than 30 years. The age group 10-19 years had the highest infection prevalence (52.17%), followed by the age group 0-9 years (44.93%). While only 2.90 % of people aged 20 to 29 years (Figure 2)

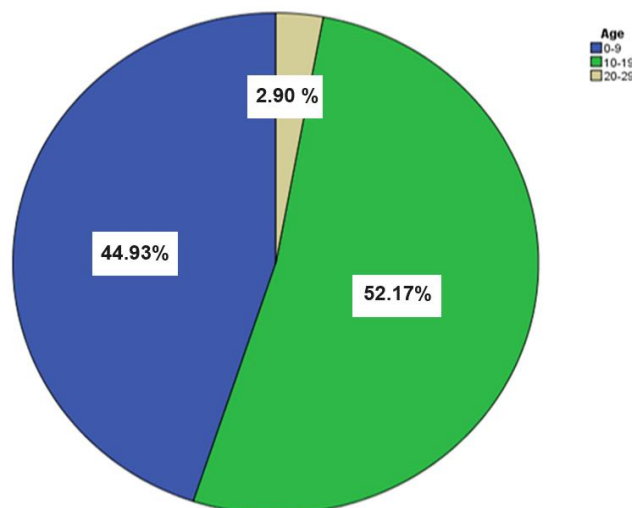


Figure 2: Distribution of epidemic jaundice cases according to age.

Conclusion immunocompromized are risk factors to any infections, such as elderly people, as the human age progresses, the resistance of immune system deficiencies gradually becomes more susceptible to infectious diseases [22]. Also, children have a weak immune system. In the present study, the emergence of the epidemic coincided with the time of the opening of schools and Quran memorization centres in the city of Bani Walid, so it is possible that this was the reason that contributed to the spread of the disease among this age group. In the present study, the emergence of the epidemic coincided with the time of the opening of schools and Quran memorization centres in

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In this study, the predominance of total bilirubin rates in infected cases ranged from 1.5 to 6.0 mg/d (44.95% and 31.6%). Just 8.6% of infected cases had high bilirubin levels, raised from 6 to 15 mg/d. A study by L. N. Hung et al 2015 (17) found total bilirubin ≥ 3.0 - < 6.0 at 39.7% and 29.8% in total bilirubin range ≥ 6.0 - < 15.0 .

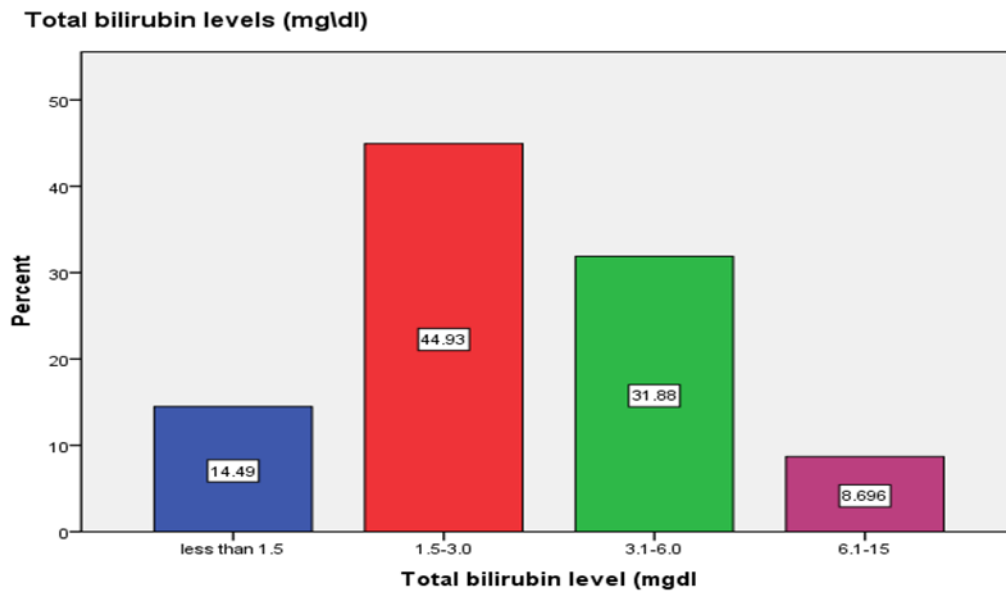


Figure 3: Distribution of total bilirubin levels in epidemic jaundice cases.

The curve in Figure 4 shows the number of infected cases during the epidemic period from Oct 2017 to Jan 2018. peak prevalent rates of jaundice cases were in Oct and Nov 2017 declined Dec 2017 and disappeared in 2018. Due to the overcrowding of students and poor ventilation in schools at this time of year, infection cases peaked in Oct and Nov and dropped in Jan 2018 as a result of the midterm holiday in Jan.

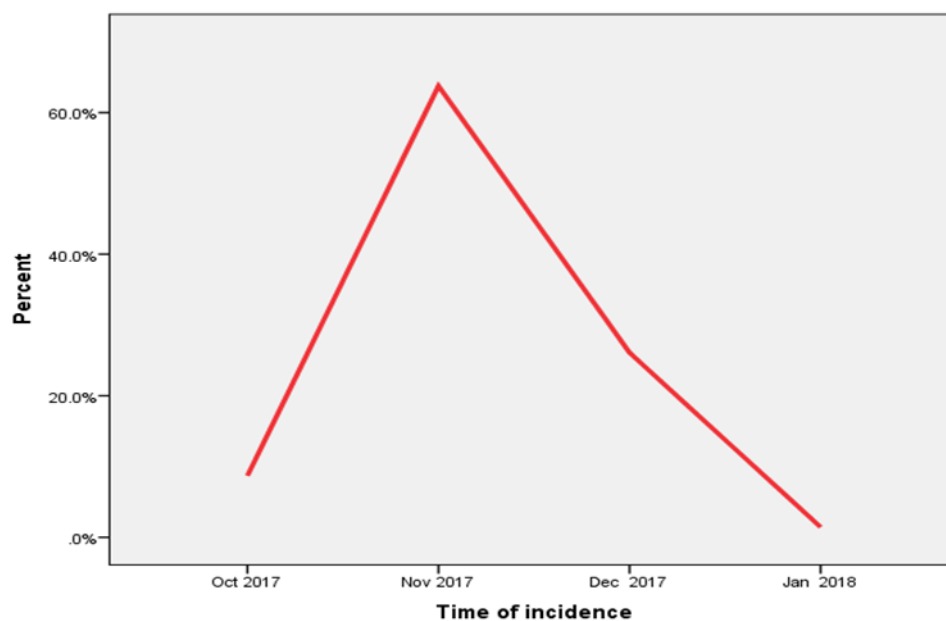


Figure 4: Frequency of epidemic jaundice incidence in Bani Walid City.

Conclusion

In conclusion, viral epidemic jaundice can spread with high frequency due to poor personal hygiene and crowded conditions, especially among children. So, avoiding direct contact with infected cases, maintaining sanitary conditions in epidemic areas, and vaccinating children and adolescents, international travellers, people with occupational risk and people with chronic liver disease are crucial first-line management and prevention measures.

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