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THE ROLE OF TOTAL SERUM BILIRUBIN FOR DIAGNOSIS OF ACUTE APPENDICITIS

General Surgery

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ABSTRACT

OBJECTIVES: To determine the role of elevated serum bilirubin in the diagnosis of acute appendicitis.
METHODS: The study conducted in the period from January to July 2008 included 58 patients admitted to surgical department at Prince Rashed Bin Al-Hassan Hospital with clinical diagnosis of acute appendicitis. Preoperatively patient's blood was collected for serum bilirubin. The study divided postoperatively into two study groups: Group I: 22 (37.9%) with acute appendicitis (males: 19 and females: 3. and their age ranged from 12 to 36 years), Group II: 36 (62.1%) without acute appendicitis (males: 32 and females: 4. and their age ranged from 14 to 38 years). Receiver Operating Characteristic (ROC) curve analysis used to find the best total bilirubin cutoff value for discrimination of acute appendicitis.
RESULTS: Total serum bilirubin among patient with acute appendicitis (6.83 ± 2.9 mg/dL) was statistically higher than patient without acute appendicitis (0.78 ± 0.67 mg/dL) P-value < 0.0001.
The total serum bilirubin cutoff value > 1.69 mg/dL showed sensitivity 100% (95% CI, 84.4-100%) and specificity 91.67% (95% CI, 77.5-98.2%).
CONCLUSION: Elevated total serum bilirubin is a good indicator and a new diagnostic tool for acute appendicitis.

KEYWORDS

Acute Appendicitis, Total Serum Bilirubin Cutoff Value

INTRODUCTION

Appendicitis is Acute inflammation and infection of the vermiform appendix, which is usually referred to as the appendix. The appendix is blind-ending structure that arises from the cecum. Acute appendicitis is one of the most common causes of abdominal pain and is the most frequent condition that leads to emergent abdominal surgery [1-8]. Patient generally first experience pain that begins near the navel before moving to the lower right abdomen [9-12]. Liver receives blood mainly through portal venous system, which receives blood from abdominal organs. Most of the surgeons either they change their diagnosis or delay on starting correct treatment once elevated total serum bilirubin or jaundice is detected in a clinically suspected case of acute appendicitis [13-15]. Our goal in this study to evaluate hyperbilirubinemia associated in acute inflammation of appendix (acute appendicitis and its complications).

METHODS

The study conducted in the period from January to July 2008 included 58 patients admitted to surgical department at Prince Rashed Bin Al-Hassan Hospital in North of Jordan with clinical diagnosis of acute appendicitis. Preoperatively patient's blood was collected for serum bilirubin. The patients with history of any liver diseases were excluded from this study. The study divided postoperatively into two study groups: Group I: 22 (37.9%) with acute appendicitis (males: 19 and females: 3. and their age ranged from 12 to 36 years), Group II: 36 (62.1%) without acute appendicitis whom had elective surgery for repairing inguinal hernias and they considered as an control group (males: 32 and females: 4. and their age ranged from 14 to 38 years). Receiver Operating Characteristic (ROC) curve analysis used to find the best total bilirubin cutoff value for discrimination of acute appendicitis.

RESULTS

There was no difference between the age of acute appendicitis group (12.3-36 years. 19 males and 3 females) and the age of control group (14.8-38 years. 32 males and 4 females). (P-value = 0.775). Acute appendicitis cases are more common in males but, there was no difference between males and females in both groups (P-value = 0.775) and the results obtained were not divided according to gender (P-value = 0.775). A statistically significant difference of total serum bilirubin (mg/dL) was noted in the acute appendicitis group (6.84 ± 2.92 mg/dL) when compared with the negative acute appendicitis control group (0.77 ± 0.67 mg/dL) with (P-value < 0.0001), as shown in Table 1 and Figure I.

Table II, Figure II and Figure III, show the identification of acute appendicitis to be highly sensitive and specific, whenever using total serum bilirubin > 1.69 mg/dL. The sensitivity was 100% (95% CI; 84.4-100%), specificity 91.67% (95% CI; 77.5-98.2%).

DISCUSSION

In this study, 58 patients referred to surgical department, we were able to identify 22 patients with acute appendicitis with high value of total serum bilirubin compared with 36 control group with significantly low value of total serum bilirubin. Therefore, this study which is directed by ROC curve analysis find that the total bilirubin cutoff value of more than 1.69 mg/dL. This result is somewhat consistent with other studies that had adopted similar cutoff value for total bilirubin serum concentration [14,16-17]. The sensitivity of elevated total serum bilirubin in acute appendicitis is almost similar to that of elevation in total leukocyte count and C-reactive protein (CRP) [16-21]. It was found that elevated total serum bilirubin without sever abnormalities in the value of liver enzymes is good indicator of acute appendicitis and should not delay in beginning proper management of acute appendicitis, suspecting that rise in total serum bilirubin is because of primary hepatobiliary pathology.

CONCLUSION

We found that elevated total serum bilirubin support surgeon's clinical diagnosis. We recommended total serum bilirubin measurement as a routine laboratory test in patient with suspected diagnosis of acute appendicitis.

Table I. Socio-demographic characteristic of the study group & comparison of total serum bilirubin between two groups.

Variable	*Acute appendicitis group*	*Control group*	*P-value*
Males	19 (32.8%)	32 (55.2%)	**0.775**
Females	3 (5.2%)	4 (6.9)	
Total	22 (37.9%)	36 (62.1%)	

Age per years Mean ± SD Range per years	23.9 ± 5.8 12.3 - 36	24.4 ± 5.9 14.8 - 38	**0.790**
Total Serum Bilirubin mg/dL Mean ± SD	**6.84 ± 2.92**	**0.77 ± 0.67**	**< 0.0001**

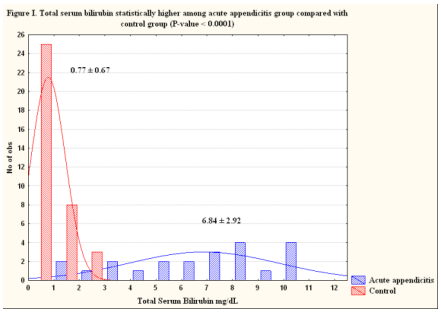
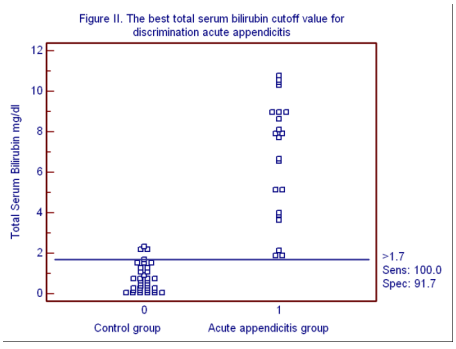
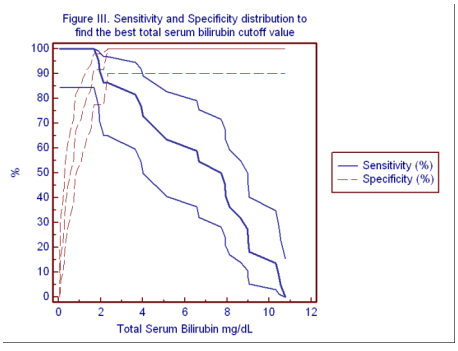


Table II. The best total serum bilirubin cutoff value (mg/dL) for discrimination of acute appendicitis.

	Acute appendicitis	*Control*	*Sensitivity*	*95% CI*	*Specificity*	*95% CI*
> 1.69	22 (37.9%)	4 (6.9%)	100%	84.4-100%	91.67%	77.5-98.2%
≤ 1.69	**0 (0%)**	**32 (55.2%)**				





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