



EVALUATION OF IMPORTANCE OF S BILIRUBIN LEVEL IN CASES OF SIMPLE AND COMPLICATED ACUTE APPENDICITIS.

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ABSTRACT

Acute appendicitis is the commonest cause of "Acute Surgical abdomen". The diagnosis of Appendicitis still remains a dilemma in spite of advances in the radiological and laboratory investigations. Experienced clinicians accurately diagnose appendicitis based on a combination of history, physical examination and laboratory studies about 80% of the time. The present study was undertaken to assess relationship between hyperbilirubinemia and acute appendicitis/perforated appendicitis and to evaluate its importance as a diagnostic marker

KEYWORDS

Appendicitis, hyperbilirubinemia

INTRODUCTION

Acute appendicitis is the commonest cause of "Acute Surgical abdomen".

The diagnosis of Appendicitis still remains a dilemma in spite of advances in the radiological and laboratory investigations.

Experienced clinicians accurately diagnose appendicitis based on a combination of history, physical examination and laboratory studies about 80% of the time. Although most patients with acute appendicitis can be easily diagnosed, in some cases the sign and symptoms are variable and diagnosis can be difficult.

This is particularly true where the appendix is retrocaecal or retroileal. The percentage of appendicectomies performed where appendix subsequently found to be normal varies 15– 50% and postoperative complications can occur in up to 50% of these patients.

Delay in diagnosis of acute appendicitis leads to perforation and peritonitis and increased mortality. Perforation ranges 50–90% in various series.

To supplement the clinical diagnosis and to reduce the frequency of unnecessary appendicectomy, the importance of laboratory investigations like White Blood Cell (WBC) counts and C-reactive protein (CRP) etc values has been stressed. The use of Ultrasonography (USG) as a diagnostic tool for appendicitis has been widely known and studied.

Various scores combining clinical features and laboratory investigations have also been developed and are good enough to reach the diagnosis.

However upto date there is no confirmatory laboratory marker for the pre-operative diagnosis of acute appendicitis and appendicular perforation. Recently, elevation in serum bilirubin was reported, but the importance of the raised total bilirubin has not been stressed in acute appendicitis and appendicular perforation.

The present study was undertaken to assess relationship between hyperbilirubinemia and acute appendicitis/perforated appendicitis and to evaluate its importance as a diagnostic marker.

Inclusion Criteria: All clinically diagnosed case with acute appendicitis (simple and complicated).

Exclusion Criteria:

1. Individuals with history of confirmed hepatitis or liver disease or HBsAg positive.
2. Individuals with age less than 13 years of age.
3. Patients with known congenital liver diseases like Gilbert syndrome, Dubin – Johnson, Rotor's syndrome and Crigler – Najjar syndrome.
4. Individuals with intra or extra hepatic cholestasis.
5. Individuals with haemolytic anemia.
6. Chronic alcoholism (i.e. intake of alcohol of >40g/day for Men and >20g/day in Women for 10 years).

RESULTS

As per the study, the age group <20 years is most commonly affected (24%) followed by age group 20-24 (21%). The youngest patients of this study were of 15 years old while the oldest patient was a 60 year old

Age	Frequency	Percent
< 20	24	24.0
20 – 24	21	21.0
25 – 29	19	19.0
30 – 34	17	17.0
≥35	19	19.0
Total	100	100.0

Table 1 : Distribution of patients by age

Out of 100 patients enrolled for the study, 68 patients (68%) were males while the remaining 32 patients (32%) were females

Sex	Frequency	Percent
Female	32	32.0
Male	68	68.0
Total	100	100.0

Table 2 : Sex distribution

The overall mean age of all 100 patients was 27 years (range, 15-60 years).

The average age in males and females was 27.04 years and 26.71 years respectively.

Sex	Age(yrs)	SD
Male	27	10.30
Female	26	7.96
Overall	27	9.58

Table 3: Mean Age distribution among sex

Among the study group 28 patients had serum bilirubin levels >1mg% and 72 patients <1mg%.

Serum bilirubin levels	Frequency	Percent
Elevated	28	28.0
Normal	72	72.0
Total	100	100.0

Table 4: Serum bilirubin levels in study population

Among the study population 29 patients were diagnosed of having perforated appendicitis.

Intra operative finding	Frequency	Percent
Perforated	29	29.0
Simple	71	71.0
Total	100	100.0

Table 5 : Intra-Operative findings in study population

Sensitivity: Sensitivity of bilirubin in predicting acute appendicitis and Appendicular perforation diagnosis was 65.5%

Specicity: Specicity of bilirubin in predicting acute appendicitis and appendicular perforation diagnosis was 87.3%

Positive Predictive Value: Positive predictive value of bilirubin in

predicting acute appendicitis and Appendicular perforation diagnosis was 67.9.

Negative Predictive Value: Negative predictive value of bilirubin in predicting acute appendicitis and Appendicular perforation diagnosis was 76.5%.

Odds Ratio: Odds ratio is 13

INTA OPERATIVE FINDINGS	Serum bilirubin levels				Total	
	ELEVATED		NORMAL			
	N	%	N	%	N	%
PERFORATED	19	65.5	10	34.5	29	100
SIMPLE	9	12.7	62	87.3	71	100
TOTAL	28	28	72	72	100	100

$\chi^2=28.517$ df= 1 P<0.001

Table 6: Bilirubin levels in perforated and simple appendicitis

Serum bilirubin levels	Intra-operative finding		Total
	Perforated	Simple	
Elevated	19	9	28
Normal	10	62	72
Total	29	71	100

Table 7: Accuracy of serum bilirubin as a marker in predicting Appendicular perforation

DISCUSSION

In this study of 100 patients, hyperbilirubinemia was found in 19 of 29 patients with gangrenous/perforated appendicitis.

This hyperbilirubinemia was mixed in type (both conjugated and unconjugated) in most of the patients and at the same time there was no elevation or minimal elevation (<100 U/L) in ALT and AST in most of the cases. For gangrenous/perforated appendicitis,

- The P-value of SB was <0.001,
- Specicity 87.3%,
- Sensitivity 65.5%,
- Positive predictive value 67.9%
- Negative predictive value was 86.1% and accuracy value of 81%.

The level of Serum bilirubin was higher than 1 mg/dL in cases of gangrenous/perforated appendicitis while in cases with acute appendicitis it was lower than 1mg/dL (P<0.05). The most likely explanation of the rise in SB is therefore circulating endotoxinemia as a result of appendiceal infection.

It was demonstrated by **Sisson et al** in 1971 and was observed by **Dieulafoy**

Recently, in one study, blood samples from the superior mesenteric vein in acute appendicitis showed bacteria in 38% of patients These findings suggest that bacteria may transmigrate and produce portal bacteremia, hepatocellular dysfunction or pyogenic liver abscess. Our study shows that isolated hyperbilirubinemia without much elevation in the liver enzymes is a significant predictor of appendiceal perforation.

This was demonstrated by a study by **Estrada et al** and other studies showing nearly a **threefold risk** of perforated appendicitis in patients with total bilirubin levels greater than 1 mg/dL.

Therefore, in suspected cases of appendicitis elevation of Serum bilirubin can be used as a criterion to diagnose and manage acute appendicitis, especially when there is doubtful differential diagnosis were considered like right uretric colic, mesenteric adenitis, right salphingitis

CONCLUSION

This study suggests Serum bilirubin levels appears to be a promising new laboratory marker for diagnosing acute appendicitis.

Patients with clinical signs and symptoms of appendicitis and with hyperbilirubinemia higher than the normal range should be identified as having a higher probability of Appendicular perforation. Therefore, obtaining Serum bilirubin values upon admission can be used in conjunction with more modern diagnostic tests such as CT scan, ultrasonography to help determine the presence of perforation and thus aid in prompt clinical management.

Serum bilirubin levels may be considered as one more positive factor for strong suspicion of appendicitis or perforated appendix in differential diagnosis of right iliac fossa pain.

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