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Hyperbilirubineamia in A/C appendicitis

Dr. Biju P R[1],Dr. Anjali Dathan[2],Dr. Sajeesh K R[3],Dr. P J Babu[4]
Assistant Professor, Govt. Medical College, Thrissur / Associate Professor, Govt. Medical College, Palakkad / Consultant Surgeon, District Hospital, Palakkad / Professor Govt. Medical College, Manjeri

Abstract
Introduction*: A/C appendicitis is a common surgical emergency which is mostly a clinical diagnosis, confirmed by investigations. But with all advanced investigations misdiagnosis and missed diagnosis are common resulting in morbidity and mortality. Recently many papers are coming up regarding hyper bilirubineamia in A/C appendicitis, more so with gangrenous and perforated appendicitis.*
Materials and Methods : *This study was conducted on patients admitted with a diagnosis A/C appendicitis and surgery departments Govt. Medical College, Thrissur from September 2010 to Decembers 2011 with inclusion & exclusion criteria. Hyper bilirubineamia was studied in all these patients with the liver enzyme analysis.*
Results *:- The study consisted of 85 patients among which 41 were males and 44 were females and the age ranged from 13 to 49. Bilirubin ranged from 0.6 mg/dL to 6 mg/dL with a mean of 1.19 +/- 0.94 mg/dL. SGOT ranged from 16 – 74, SGPT from 14 – 80 and ALP from 74 -360. Bilirubin level with more than 1mg/dL were considered hyper bilirubineamic among the 85, 25 were hyper bilirubinimic (29.47%). Among the 25 patients 5 were gangrenous and 7 had perforated appendix. Hyper bilirubineamia was found in 2 of the gangrenous appendicitis (40%) and 3 of the perforated appendicitis (42.9%).*
Conclusion *: - Hyper bilirubineamia is seen in a significant number of patients with A/C appendicitis. It was also found that patients with perforated appendix, abscess and gangrenous appendicitis have got a mean higher value of bilirubin but with out much statistical significance.*
Keywords: *Hyperbilirubinimia, A/C appendicitis*

I. Introduction

A/C appendicitis is one of the commonest surgical emergencies. Appendicitis is more of a clinical diagnosis and helped by ultrasound scan of the abdomen and other laboratory investigations. But missed diagnosis and unnecessary surgeries are common leading to morbidity and to certain extend mortality. The spectrum of appendicitis ranges from simple inflammation to gangrenous, perforated appendix and sometimes appendicular abscess.Recent trials have shown an increase in bilirubin level and variation in liver enzyme levels in cases of A/C appendicitis more with gangrenous and perforated appendix.Hyper bilirubineamia is the result of imbalance of production and excretion of bilirubin by the liver. The portal vein carries substances absorbed from the gut including the bacteria and their toxins. This is cleared by detoxification and immunological system comprising of the recticulo endothelial system of liver. But when the bacterial load overwhelms the kupfer cell function, may cause damage to hepatocyte and bilirubineamia.Transmigration / trans location resulting from inflammation can suppress hepatocellular function and reduced excretion of bile from biliary canaliculi. Intrahepatic cholestasis can be due to drugs, hormones, primary biliary cirrhosis or sepsis. The mechanism of sepsis causing hepatic dysfunction can be due to bacteria, toxins.

II. Material And Methods

Subjects :
Patients admitted under surgery units with a diagnosis of acute appendicitis are included in the study.
Study sample :
All patients admitted with a diagnosis of acute appendicitis in surgery dept. from Sept 2010 to Dec. 2011.

Inclusion criteria :
- Patients who underwent emergency appendicectomy with a modified Alvarado score more than 7 at our institution with histopathologically positive acute appendicitis.
- Patients with test negative for HIV, HBSAg and anti HCV.
- Patients older that 13 years of age to 60 years age.

Exclusion Criteria :

- Case with test positive for HIV, HBSAg or Anti HCV.
- Case with S. Bilirubin>1mg/dl 2 weeks after surgery
- Appendectomy performed incidentally or past for other indications
- Alcoholics who drinks more than 25 units per week

III. Materials And Methods

Patients fulfilling all the inclusion and exclusion criteria subjected to detailed clinical examination to assess the "modified Alvarado scoring' and the s.Bilirubin (Total & Direct), SGPT, SGOT and s.ALP levels are estimated at the time of admission.

Ethical concern :

The study will confine to the guidelines of Declaration of Helsinki 1964 revised in 1975. The study will be subjected to ethical review board of the study centre. Patients will be fully informed of the study protocol. His or her right to opt out of the study without prior notice is explained and written consent is obtained from the patients of first degree relatives for his or her inclusion in the study. No invasive or non invasive procedure is done on the patients as a part of the study. Only necessary investigations that form a part of the evaluation of these patients are done and the facilities for which available in the Government Medical College, Thrissur.

Patients who are coming to our emergency department with acute abdominal pain are clinically evaluated. And patients who are clinically suspicious of acute appendicitis are subjected to investigations. The cases diagnosed to have a/c appendicitis by clinical evaluation are chosen for surgical intervention. The clinical details are entered in the proforma. The potential candidates are subjected to biochemical tests (S. Bilirubin (Direct, Indirect), ALT AST, ALP) pathological tests (TC, Peripheral smear) and microbilogical tests (HIV, HBsAg, Anti HCV) after obtaining the consent.

Now the patient is taken for surgery. The status of appendix and the presence or absence of pus of the time of surgery is recorded. The specimen is subjected to histopathological examination. Those patients who are having HPR positive for appendicitis are considered for further follow up in the study. The biochemical parameters (S. Bilirubin (Direct, Indirect), ALT, ST, ALP) are reassessed on the third week after surgery. The results are statistically analysed.

Data Analysis

Table (1); Discriptives of Age, Bilirubin, SGOT and ALP

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	85	13	49	27.12	11.22
Bilirubin	85	.6	6.0	1.19	0.94
SGOT	85	16	74	35.41	15.12
SGPT	85	14	80	35.29	16.71
ALP	85	74	360	147.9	59.83

Table (2); Discriptives of Age, Bilirubin, SGOT and ALP

Bilirubin	Frequency	Percent
Normal (<1mg/dL)	60	70.6
Abnormal (>_1mg/dL)	25	29.4
Total	85	100.0

Fig : (1) Distribution of Serum bilirubin level

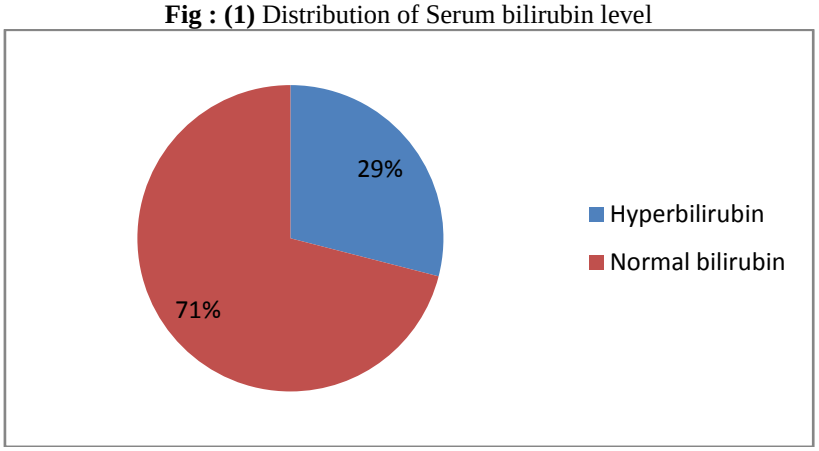

Table (3); Per op findings and the serum bilirubin levels noted against each category

Peroperative findings	Total SB				Total	
	<1mg / dL		>1mg / dL			
	N	%	N	%	N	%
Acute Appendictics	44	71.0	18	29.0	62	100
Perforated Appendix	4	57.1	3	42.9	7	100
Abscess	5	71.4	2	28.6	7	100
Gangremous	3	60.0	2	40.0	5	100

Among the patients with acute appendicitis, 29% of them were hyperbilirubinimic. Gangrenous appendix were found in 5 patients, among them 3 had normal bilirubin and 2 had elevated bilirubin. 7 patients had perforated appendix, among them only 57.1% of them had normal bilirubin were as 42.9% of them had hyperbilirubinimia.

Table (4); Association between perforation and bilirubin level

Perforation	N	Mean bilirubin (mg/dL)	Std. Deviation	T	P
Absent	78	1.19	0.96	0.146	0.884
Present	7	1.24	0.68		
Present	7	1.24	0.68		

Fig : (2) Comparison of mean Bilirubin level

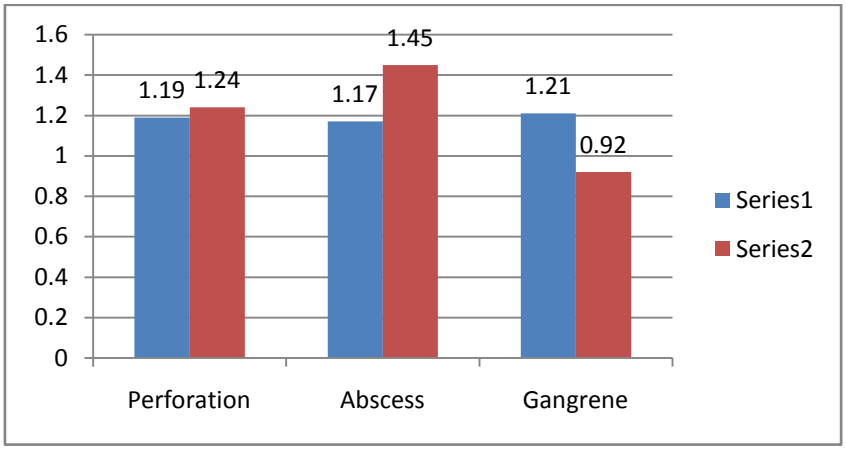

Table (5); Association between perforation and bilirubin level

Perforation	Bilirubin				Total	
	Normal		Abnormal			
	N	%	N	%	N	%
Absent	56	93.3%	22	88.0%	78	91.8%
Present	4	6.7%	3	12.0%	7	8.2%
Total	60	100.2%	25	100.0%	85	100.0%

$X^2 = 0.664$ df = 1 p = 0.415

the patients with normal bilirubin appendiceal perforation is only 6.7% while those having abnormal bilirubin appendiceal perforation was found to be 12%. The observed difference is not statistically significant (p>.05)Mean bilirubin level of thepatients having abscess 1.45 mg/dL and that of the patients withour abscess was 1.17 mg/dL. Present study shows that there is no significant difference in mean bilirubin levels between the patients with abscess and those having no abscess formation.

The above bar graph depicts the mean bilirubin levels of the patients having various per operative findings. Patients with Gangrene has mean bilirubin level o.92 mg/dL (± 0.13 mg/dL sd) and those with non gangrene appendicitis, mean bilirubin 1.21 mg/dL ; (± .97 mg/dL sd). Mean bilirubin level of the patients having abscess 1.45 mg/dL and that of the patients withour abscess was 1.17 mg/dL. The mean bilirubin level of all patients was 1.19 mg/dL (± 0.94 sd; rang 0.6 mg/dL – 6.0 mg/dL;) Patients with appendiceal perforation, however had a mean bilirubin level 1.24 mg/dL and those with a non peforated appendicitis has mean bilirubin 1.19 mg/dL.Patients undergoing appendicectomy having complications like perforation, Abscess, and Gangrene, however had a mean bilirubin level 1.24 mg/dL (± 0.85 mg/dL sd) which was not significantly higher than those having inflamed appendix alone (mean bilirubin 1.18 mg/dL; 0.97 mg/dL sd; p>.05)

Table (6); Association between Complications and bilirubin level

Complication	Bilirubin				Total	
	Normal		Abnormal			
	N	%	N	%	N	%
Absent	48	80.0%	18	72.0%	68	78.2%
Present	12	20%	7	28.0%	19	21.8%
Total	60	100.0%	25	100.0%	87	100.0%

$X^2 = 0.651$ df = 1 p = 0.420

Among the patients with hyper bilirubin the incidene of complications was found to be 28.0 % while that of those with normal appendix was only 20%. The observed percentage difference among the two group is not statistically significant (p = 0.420)

Table (7); SGOT, SGPT and ALP levels according to complications

Variable	Complication (Perfn, /Abscess/ Gangrene)	N	Mean	Std. Deviation	T	P
SGOT	Absent	66	35.21	15.01	0.226	0.882
	Present	19	36.11	15.88		
SGPT	Absent	66	36.56	17.67	1.308	0.195
	Present	19	30.89	12.22		
ALP	Absent	66	152.79	65.21	1.421	0.159
	Present	19	130.79	30.89		

Among patients undergoing appendicectomy 48%were males and 52 % were females. The bilirubin level ranges from 0.6 mg/dL to 6.0 with mean 1.3+0.9 mg/dL. The patients having bilirubin level »1 are considered as hyperbilirubinimic and those having <1 are considered as normal. The study shows that 71% of the patients under going appendicectomy were having bilirubin <1 mg/dL and the remaining 29 % were hyperbilirubinimic. Among the patients with acute appendicitis, 29% of them were hyperbilirubinimic. Gangremous appendix were found in 5 patients, among them 3 had normal bilirubin and 2 had elevated bilirubin. 7 patients had perforated appendix, among them 57.1 °/ of them had normal bilirubin where as 42.9 % of them had hyperbilirubinimia

In the present study shows that the patients with appendicitis 8 % of them had perforated appendix. The above table shows that 3 out of 25 of the hyper bilirubinimic patients had perforated appendix where as Only 4 out of 60 of the normal bilirubin had perforated appendix (sensitivity = 0.43). Patients with appendiceal perforation , however, had a mean bilirubin level 1.24 mg/dL (+ .68 mg/dL sd) which was not significantly higher than those with a non peforated appendicitis (mean bilirubin 1.19 mg/dL ; + 0.96 mg/dL sd; p=.884). . Among the patients with normal bilirubin appendiceal perforation is only 6.7 %, while those having abnormal bilirubin appendiceal perforation was found to be 12%. The observed difference is not statistically significant (p».05)

Patients with Gangrene had mean bilirubin level .92 mg/dL (± 0.13) mg/dL sd) ann those with non gangrene appendicitis, mean bilirubin 1.21 mg/dL; (±.97 mg/dL sd). Mean bilirubin level of the patients having abscess 1.45 mg/dl and that of the patients without abscess was 1.17 mg/dL. Present study shows that there is no significant difference in mean bilirubin levels between the patients with abscess and gangrene.

The distribution of intra operative findings shows that perforated appendix and absess had incidence of 8.2 % each among the patients with appendicitis. 22.4% of the patients with appendicitis has complications like peroforation, or Abscess of/0r gangrene

Patients undergoing appenti8cectomy having complications like Perforation, Abscess, and Gangrene, however had a mean bilirubin level 1.24 mg/dl (± 0.85 mg/dl sd) which was not significantly higher than those hav9ing inflamed appendix alone (mean bilirubin 1.18 mg/dl; ± 0.97 mg/dL sd; p> .05)

Among the patients with hyper bilirubin the incidence of complications was found to be 28.9% while that of those with normal bilirubin was only 20%. The observed percentage difference among the two group is not statistically significant (p=0.420).

The association between complications and SGPT, SGOT and ALP not statistically significant.

IV. Conclusions

- Hyperbilirubinimia in acute appendicitis can happen, but this study doesn't show any significant association.
- Also it was found that pts with perforation, abscess, gangrene have got a mean higher value for bilirubin withour any significance.
- In all pts with appendicitis presenting with hyperbilirubinimia the s.bilirubin level fell to normal range within 1-2 weeks. Hence the finding of hyperbilirubinimia in the setting of a/c appendicitis is a usual

patho physiological phenomenon & should not be confused with a/c viral hepatitis. Therefore further evaluation of viral markers is unnecessary if SGOT-SGPT levels are only mildly elevated.

Bibiligraphy

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