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Diagnosis, and Outcome of Tuberculous Peritonitis in Low Heath Services of Sudan

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Abstract

***Background**: Abdominal tuberculosis, which may involve the gastrointestinal tract, peritoneum, lymph nodes or solid viscera, constitutes up to 12% of extraplumonary tuberculosis and about 3% of the total cases(2). In Sudan in 2009 estimated tuberculosis incidence was 209/100000 which gave 50000 cases and mortality rate of 12/100000 {1}. In most parts of the country essential investigations like CT scan, MRI, and PCR are not available and also laparoscopic surgery. Therefore, the diagnosis of tuberculous peritonitis depends mainly on clinical background. Undiagnosed and untreated patients results in mortality rate of 50-60%. However the disease is usually curable when treated properly.*

***Methods**: This study was carried out in Sinnar Teaching Hospital, in the period from January 2015 to December 2019.The data was collected from 76 patients. The diagnosis depended on clinical suspicion, history of tuberculosis contact with tuberculous patient, symptoms, clinical signs and investigations. All the patient received standard antituberculosis therapy for 6 months plus Prednisolone for 8 weeks.*

***Result**: 74(97.67%) patients were cured and 2(2.63) passed away. Body mass index increased significantly after cure. PCR for mycobacterium tuberculosis in ascetic fluid was done in 35 patients, mycobacterium tuberculosis detected in 32 (91.4%).*

***Conclusion**: In Situation of Low Health Services of Sudan, the diagnosis of tuberculous peritonitis depends mainly on high clinical suspicion. Standard antituberculosis therapy plus Prednisolone give good out come.*

Keywords: tuberculous peritonitis, mycobacterium therapy, antituberculosis therapy and Prednisolone.

INTRODUCTION

Sudan is a large poor country with national income per capita of less than two thousand dollars. In 2009 the estimated tuberculosis incidence was 209/100000 which gave 50000 cases and mortality rate of 12/100000 {1}.

Tuberculosis causes approximately 3 millions death per year worldwide and is increasing in incidence in the developed and developing countries. Abdominal tuberculosis, which may involve the gastrointestinal tract, peritoneum, lymph nodes or solid viscera, constitutes up to 12% extraplumonary tuberculosis and about 3% of the total cases (2).The disease can mimic any inflammatory condition, including inflammatory bowel diseases., malignancy, and other infectious diseases (3) .The diagnosis is often delayed, even through known that the peritoneum is one of the most common extraplumonary sites of tuberculous infection (4) . Undiagnosed and untreated

patients result in mortality rate of 50-60% (5). The disease is usually curable when treated properly. Typically the spread of mycobacterium tuberculosis occurs hematologically from pulmonary foci. Also the organism can enter the peritoneum cavity transmurally from an infected small intestine or contiguously from tuberculous salpingitis.(4 -6).The clinical picture has been divided into three types; the wet ascetic type , the fixed fibrotic type, and the dry plastic type. The wet ascetic type is most common and is associated with large amount of free or located fluid in the abdomen.

Diagnosis is based on high degree of clinical suspicion, imaging, and acetic fluid analysis. Chest X ray may show old evidence of tuberculosis, and only 14% show active pulmonary tuberculosis(4)

US abdomen usually shows findings of mesenteric thickness of >15 mm, an increase in mesenteric echogenicity, and mesenteric lymphadenopathy (7). CT scan help to distinguish between tuberculous peritonitis and peritoneal carcinomatosis, which has typically more nodular implants and more irregular peritoneal thickening pattern (8). CT scan and US should be used together for an accurate diagnosis, with CT scan showing omental thickening more accurate and with US showing the mobile separation in the peritoneum more accurate(9).

Acetic fluid in tuberculous peritonitis is associated with high total leukocytes counts, higher proportion of lymphocytes, higher protein concentration and adenosine deaminase activity (ADA) (10). Detection of mycobacterium tuberculosis (MTB) in ascetic fluid using Ziehl-Neelsen (ZN) staining of the smears or Lowenstein-Jensen culture done for ascetic fluid is very low for diagnosis of abdominal tuberculosis. Ziehl-Neelsen (ZN)staining of ascetic fluid for mycobacterium detection is positive only in 3 % of the cases proved to be Tuberculous peritonitis while culture detection range is from 21 -35%(11-12) . Polymerase chain reactions (PCR) appears to be an ideal tool and rapid method of identification of mycobacterium tuberculosis in ascetic fluid with 94% sensitivity and 88% specificity (13)

Appropriate treatment must be started immediately on patient with high clinical suspicion before the result of any test or culture especially in remote poor area where the only investigations available are direct microscopic smear for detection of acid fast bacilli in sputum and acetic fluid ,protein total leucocytes counts and differential in acetic fluid, X ray and ultrasound. Using corticosteroid with standard antituberculosis therapy significantly reduced mortality in all form of tuberculosis(14).

Problem

Tuberculosis is a major health problem in Sudan, that affect more the poor population. This study tries to touch on tuberculous peritonitis as a serious complication of tuberculosis in situation of low Health Services in Sudan.

Patients and Methods

This study was carried out in Sinnar Teaching Hospital, in the period from January 2015 to December 2019.The data was collected from 76 patients. The diagnosis depended on clinical suspicion, history of tuberculosis contact with tuberculous patient, symptoms, clinical signs and investigations. All the patients received standard anituberculous therapy for 6 months plus Prednisolone for 8 weeks.

The investigations done were the following:-

1- US abdomen and pelvis done for all the patients.

2- CT scan abdomen done for 16 patients for financial reasons. It was not available in Sinnar State during the period of the study.

3-Ascetic fluid analysis was done for all the patients with ascites 66 (86.84%). These investigations were total protein, total white cells count and differential, and ZN stain for mycobacterium tuberculosis. For financial reasons PCR was done for 35 patients.

4- HIV screening test was done for all patients.

Body mass index calculated initially and monthly for 6 months. All patients received standard treatment for tuberculosis according to their weight (ethambutol, rifampicin, isoniazid and pyrazinamide) daily for two months .Then rifampicin and isoniazid for another4 months. Also all patients received prednisolone 10 mg for four sex weeks, then 5mg for 2weeks.

Objective

Diagnosis, treatments and outcome of tuberculous peritonitis in low Heath Services of Sudan.

RESULTS

Table(1):Explain the frequency of gender.

Category	N	%	Test Prop.	Exact Sig. (2-tailed)
Male	33	43.4%	.50	.302
Female	43	56.6%		
	76	100		

Table (2) Frequency of Age.

	10-20	21-30	31-40	41-50	51-60	Total
N	10	32	27	3	4	76
%	13.2%	42.1%	35.5%	3.9%	5.3%	100.0%

Table (3) Clinical Types of Tuberculous peritonitis.

Types	No	%
Ascetic	66	86.8
Dry plastic	7	9.2
Fixed fibrotic	3	4
Total	76	100

Table (4) Symptoms at Presentation.

Symptoms	No	**(%)**
Abdominal distention	65	**85.5%**
Loss of weight	54	**71.1%**
Recurrent abdominal pain	20	**26.3%**
Fever	8	**10.5%**
Diarrhea	6	**7.9%**

Table (5) Duration of symptoms in days.

Duration	Frequency	Percent
10-25	25	32.9%
26-40	18	23.7%
41-55	14	18.4%
56-70	14	18.4%
over 70	5	6.6%
Total	76	100.0

Table (6) HIV infected patients.

Sex	HIV positive	HIV negative	Total
Male	5(6.6%)	28(36.8%)	33(43.4%)
Female	2(2.6%)	41(54%)	43(56.6%)
Total	7(9.2%)	69(90.8%)	76(100%)

Table (7) Ascetic Fluid Observations in 66 (86.84%) patients at presentation.

Total white cells count, mean ± SD	1860±1302/µL
Lymphocyte predominant, n (%)	64(96.97%)
Neurophil predominant, n (%)	1 (1.52%)
Monocyte predominant, n (%)	0
Equivocal, n (%)	1(1.52%)
Protein more than 3 g/dl, n(%)	64 (96.97%),
Detection of MTB by ZN stains, n(%)	1(1.52%)

Table (8) The PCR for detection of Mycobacterium tuberculosis(MTB) in ascetic fluid of 35 patients.

	Positive	Negative	Total
PCR	29(82.86)%	6(17.14%)	35(100)

Table (9) Findings of U-S Abdomen.

	Frequency	Percent
Suggestive of T B peritonitis	35	46.1%
Mass	2	2.6%
Not suggestive of TB peritonitis or mass	39	51.3%
Total	76	100.0%

Table (10) Finding of CT scan abdomen in 16 patients.

	Frequency	Percent
Suggestive of T B peritonitis	13	81.25%
Mass	3	18.75%
Total	16	100.0%

Table (11) Comparisons of body mass index (BMI) before and after cure.

Paired Samples Statistics					
variable	Mean	N	Std. Deviation	T test	sig
BMI before cure	16.1722	74	2.35580	19.6	0.000
BMI after cure	20.3118	74	1.42683		

Table (12) Cure rate.

	Number	Percent
Cured	74	97.37%
Passed away	2	2.63%
total	76	100%

DISCUSSION

This study has been conducted in Sinnar Teaching Hospital in period from January, 2015 to December, 2019.The data was collected from 76 patients presented with features of tuberculous peritonitis. 33(43.4%) were male and 43(56.6%) were female. In respect to correlation test between them no significant relationship (Table 1) These patients categorized age wise into 5 groups. Most frequent group is 21-30 years old composed of 32(42.1%), the second group is 31-40 years old composed of 27(35.5%), the third group is 10-20 years old composed of 10 (13.2%), the forth group is 51-60 years old composed of 4(5.3%),the last group is 41-50year old composed of 3 (3.9%) (Table 2).

Concerning clinical types of tuberculous peritonitis, ascetic is 66(86.8%), plastic is 7(9.2%), and fixed fibrotic is 3(4%) (Table 3).

The study shows that the symptoms of presentation were as the following; abdominal distention wsa 65(85.5%), loss of weight was 54(71.1%), recurrent abdominal pain was 20(26.3%), fever was 8(10.5%),and diarrhea was 6 (7.9%)(Table 4). Regarding durations of symptom s in days were as the following in group10-25 was 25 (32.9%), in group 26-40 was 18(23.7%), in group 41-55 was 14 (18.4%), in group 56-70 was 14 (18.4%), and in group more than 70 days was 5 (6.6%) (Table 5).

7 (9.2%) patients infected with HIV, 5(6.6%) were male, and 2(2.6%) were female (table 6). Ascetic fluid analysis was done in 66(86.84%) patients presented with ascites. Lymphocytes predominant were 64(96.97%), neurophil predominant were 1 (1.52%), equivocal were 1(1.52%), protein more than 3 g/dl were 64 (96.97%), detection of mycobacterium tuberculosis by ZN stains, 1(1.52%) (table7). PCR for mycobacterium tuberculosis in ascetic fluid done in 35 patients, mycobacterium tuberculosis detected in 29 (82.86%), (Table 8).

US abdomen was done for all the patients because is cheap and easy available. It showed picture suggestive of tuberculous peritonitis in 35(46.1%), intraadominal mass in 2 (2.6%), no signs suggestive of tuberculous peritonitis or mass in 39(51.3%) patients,(Table 9). CT scan abdomen was done for 16 patients for financial reasons, (not available in Sinnar State). It showed picture suggestive of tuberculous peritonitis in13 (81.25%) and intraabdomenal mass in 3(18.75%), Table (10). All these 3 intraabdomenal masses proved to be abdominal tuberculosis after the trial of antituberculosis therapy in 2, the third received the treatment after laparotomy and histopathology result . Such CT scan findings make decision of starting trial of antituberculosis therapy so difficult. In situation of low Health Services where laparoscopic surgery not available and the patient unable for financial reason to travel for such investigation it better to start trial of antituberculosis therapy with proper counseling. Body mass index increased significantly after cure,(Table 11).74(97.37%) patients were cured and 2(2.63%) passed away (Table12).

RECOMMENDATIONS

After enumeration of study results, there are some ideas which could help further in the field of research and are better to be recommended as follow:

- Tuberculosis can present with tuberculous peritonitis that need high clinical suspicion for diagnosis specially in situation of low Heath Services of Sudan.

- Antituberculosis therapy plus prednisolone are corner stone in treating tuberculous peritonitis.

-Polymerase chain reaction (PCR) must be must available at a reasonable price for detection of mycobacterium tuberculosis because it is highly sensitive and specific.

-Laparoscopic surgery should be available in all Capital of States Hospital that belong to Ministry of Heath in Sudan.

CONCLUSIONS

This study has been conducted in Sinnar Teaching Hospital in the period from January, 2015 to December, 2019 in 76 patients presented with features of tuberculous peritonitis. The objectives of the research are to study the diagnosis, treatments and

outcome of tuberculous peritonitis in low Heath Services of Sudan. All the patient received standard anituberculous therapy according to their weight for 6 months plus Prednisolone for 8 weeks. After the six months 74(97.37%) were cured, and 2(2.63%) passed away. The body mass index is significantly increased after cure. In lack of heath facilities, clinical suspicion is essential for diagnosis of tuberculous peritonitis. PCR is the most sensitive method for detection of mycobacterium tuberculosis in ascetic fluid.

REFERENCES

1 .Ghada S Sharaf Eldin, Imad Fadl Elmula, Mohammed S Ali, Ahmed B Ali,[1=] Abdel Latif GA Salish,[3=] Kim Mallard, Christian Bottomley, and Ruth McNerney. Tuberculosis in Sudan: A study of Mycobacterium tuberculosis strain genotype and susceptibility to anti-tuberculosis drugs BMC Infec Dis.2011;11:219 Published online 2011 Aug 16.doi :10.1186/ 1471-2334-11-219

2.Farer LS, Lowell AM,Meador; MP: Extraplumonary tuberculosis in Unite States. Am J Epidemiol,1979;109:5-15

3.Jadvar H, Mindelzun RF, ,Olcott EW , Lewitt DB: Still the great mimicker ; abdominal tuberculosis. Am J Roentgenol 1997;168:1455-60.

4.Sanai FM , Bzeizi KI. Systemic review: tuberculous peritonitis - presenting features, diagnostic strategies and treatment. Alimentary Pharmacology and Therapeutics.Oct 15 2005; 22(8):685-700. {PubMed}{PubMed}{Google Scholar}.

5.Chow KM , Chow VC, Hung LC, Wong SM and Szeto CC: Tuberculous peritonitis-associated mortality is high among patients waiting for the results of Mycobacterium tuberculosis cultures of ascetic fluid samples. Clin Infect Dis 35:409-413, 2002.

6.Lazarus A, Thilagar B. Abdominal Tuberculosis. Disease-a-Month. 2007;53(1):32-38.

7.Jain R, Sawhney S, Bhargava DK. Berry M. Diagnosis of abdominaql tuberculosis: sonographic finding in patients with early disease..AJR. American journal of roentgenology. Dec1995;165(6):1391-1395. {PubMed}{PubMed}{Google Scholar}

8.Ha HK, Jung JI, Lee MS. CT differentiation of Tuberculous peritonitis and peritoneal carcinomatosis. AJR. American journal of roentgenology.Sep.1996;167(3):743-748. {PubMed}{PubMed}{Google Scholar}

9. Demirkazik FB, Akhan O, Ozmen MN, Akata D. US and CT finding in the diagnosis of tuberculous peritonitis. Acta Radiol . Jul 1996;37(4):517-520. {PubMed}{PubMed}{Google Scholar}

10. Kim NJ, Choo EJ, Kwak YG, Lee SO, Choi SH, Woo JH, et al. Tuberculous peritonitis in cirrhotic patients: comparison of spontaneous bacterial peritonitis caused by Escherichia coli with tuberculous peritonitis. Scand J Infect Dis 2009;41:852-856.

11. Manohar A, Simjee AE, Haffejee AA, Pettengell KE. Symptoms and investigative findings in 145 patients with tuberculous peritonitis diagnosed by peritoneoscopy and biopsy over a five year period. Gut. 1990;31:1130–1132. doi: 10.1136/gut.31.10.1130. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

12. Fei GJ, Zhang LF, Shu HJ. Values of different laboratory diagnostic approaches for tuberculous peritonitis. Zhongguo Yi Xue Ke Xue Yuan Xue Bao. 2018;40:534–538. doi: 10.3881/j.issn.1000-503X.10516. [PubMed] [CrossRef] [Google Scholar]

13.Schwake L, von Herbay A, Junghanss T, Stremmel W, Mueller M. Peritoneal tuberculosis with negative polymerase chain reaction results: Report of two cases. Scandinavian Journal of Gastroenterology. 2003;38:221-224.

14.Critchley JA, Young F, Orton L, Garner P. Corticosteroids for prevention of mortality in people with tuberculosis: a systemic review and meta-analysis. Lancet Infect Dis,13(3),223-237(2013). {PubMed}{Google Scholar}