SCHISTOSOMAL APPENDICITIS

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This is a retrospective study involving 4708 consecutive appendix specimens removed over a period of 6.5 years for a clinical diagnosis of acute appendicitis, 64 (1.3%) of which showed histological evidence of schistosomiasis. Thirty-four schistosomal appendicitis (SA) cases were compared with 68 non-schistosomal appendicitis (NSA) cases admitted during the same period. SA patients were older in age, usually of male sex, mostly Egyptians and tended to have a higher hemoglobin and a lower leukocyte count ($P<0.05$). Other features were not significantly different. It is concluded that, despite these differences, there are no reliable clinical or laboratory features by which SA can be predicted preoperatively. The majority of the studied patients were either discharged before the results of the histopathology study were ready and were lost to follow-up or the reports were overlooked. Therefore, we recommend that for all post-appendectomy patients living in or coming from endemic areas of schistosomiasis, the results of the histopathology study should be processed as early as possible and before the patient can be discharged so that the treatment can be commenced. Moreover, establishing a system by which infected patients could be traced and hence treated is highly recommended. *Ann Saudi Med 1995;15(4):*

The Asir region in the southwestern part of Saudi Arabia is an area endemic for schistosomiasis.[1,2] We have observed that many surgically removed appendices show histological features of schistosomiasis and as such may be the only evidence of infestation of which many patients might not have been aware before appendectomy. The majority of those patients were difficult to trace when the histopathology report was available after discharge from the hospital. It would be essential that these patients receive antischistosomal therapy on this evidence alone to avoid further complications. We have therefore decided to review the records of patients with SA with the objective of identifying some clinical and/or laboratory criteria by which the disease can be distinguished from NSA so as to keep suspected SA patients in the hospital for a longer period to start treatment when the diagnosis is histologically confirmed. This communication reports on the results of the comparison which we carried out between SA and NSA.

Patients and Methods

The histopathological reports of 4708 appendices received in the Department of Pathology, Asir Central Hospital (ACH), Abha, Saudi Arabia from January 1987 through June 1993 were reviewed. This Department receives specimens from 17 hospitals in the area. SA was identified in 64 (1.35%) specimens. The records of 34 patients admitted to ACH were reviewed regarding age, sex, nationality, clinical presentation, relevant investigations, and the histopathology of the removed appendices. These were compared with a control group of NSA consisting of 68 patients who were admitted during the same period. The data were analyzed using SPSS/PC+ software package. Chi-square, Student's t-test and Fisher exact test were used at a 5% level of significance.

Results

A comparison between SA and NSA groups regarding age, sex, nationality and clinical presentation is shown in Table 1. The age range in the SA group was 10 to 50 years (mean 31.9 ± 8.55 years) compared to 6 to 43 years (mean 22.6 ± 9.46 years) in the NSA group. Significant statistical differences were found in the average age (higher in SA group), male sex and Egyptian nationality. The most common presentation of SA was pain and tenderness in the right iliac fossa similar to that of NSA. However, abdominal guarding was observed more frequently in the SA group. Leukocytosis was more common in the NSA group ($P<0.05$), while the hemoglobin and the hematocrit percentages were significantly higher in the SA group, even after analyzing male patients separately (Table 2). The differences between the two groups in other clinical presentation and laboratory findings were not significant ($P>0.05$). The urinalysis was normal in more than 82% of

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TABLE 1. *Comparison between SA and NSA regarding clinical presentation.*

Comparison criteria	Schistosomal appendicitis	Nonschistosomal appendicitis	*P* value
Age in years (Mean ± SD)	31.9 ± 8.55	22.6 ±9.46	<0.001*
Male sex	33 (97.1%)	39 (57.4%)	<0.001*
Egyptian	26 (76.5%)	5 (7.4%)	<0.001*
RIF# pain	29 (85.3%)	59 (86.8%)	0.84
Duration/day (Mean ±SD)	1.12 ±0.51	1.65 ± 2.65	0.25
Vomiting	21 (63.6%)	48 (71.6%)	0.42
Recurrent pain	9 (26.5%)	12 (20%)	0.47
Tender RIF	33 (97.1%)	68 (100%)	0.16
Rebound tenderness	24 (85.7%)	63 (92.6)	0.29
Abdominal guarding	26 (76.5%)	37 (55.2%)	<0.001*

*=significant difference; #RIF=right iliac fossa.

TABLE 2. *Comparison between SA and NSA regarding laboratory investigations.*

Comparison criteria	Schistosomal appendicitis	Nonschistosomal appendicitis	*P* value
Hb g/dL^{-1} (Mean ± SD)	16.47 ± 1.59	14.9 ±1.67	<0.001*
WBC x $10^9 1^{-1}$ (Mean ± SD)	10.02 ± 4.17	12.23 ± 4.73	0.025*
Polymorph % (Mean ±SD)	69.29 ± 18.2	72.17 ±14.62	0.46
Eosinophil % (Mean ±SD)	3.61 ± 6.33	1.15 ± 1.28	0.06
Lymphocyte % (Mean ±SD)	25.44 ± 14.44	23.23 ± 14.7	0.53

*=significant difference.

the cases in both groups. Bilharzial ova were detected in neither urine nor stool (when done) analysis. The indirect hemagglutination assay (IHA) for schistosomiasis was done for only seven patients of the SA group and was positive in four.

In the 34 cases of SA, acute appendicitis was present in 31 (91.2%) cases, normal appendices in two (5.9%) and features of chronic inflammation in one (2.9%) case. In the NSA group, acute appendicitis was found in 60 (88.2%) cases; the difference was not significant. Unfortunately, only nine (26.5%) patients had antischistosomal treatment postoperatively.

Discussion

Schistosomiasis of the appendix was first described by Turner in 1909.[3] Halim et al. described the high prevalence of schistosomiasis in Saudi Arabia.[4] However, when we compare Asir with other provinces of Saudi Arabia, Asir is still considered to have the highest incidence of schistosomiasis.[1,2] People living in the Asir region are mostly engaged in agriculture and therefore are exposed to stagnant water that may harbor the snails. Fortunately, the incidence of appendiceal schistosomiasis in the Asir region was low (1.3%) in the present study and in another study reported previously from this region by Al-Saigh and Khan.[5] Adebamowo et al. from Nigeria reported an incidence of 2.4%.[6]

About 85% of SA patients had classical signs of acute appendicitis with tenderness and guarding plus positive rebound tenderness in the right iliac fossa when admitted to the hospital and their appendices revealed changes of acute inflammation, a finding similar to what had been reported from Riyadh by Al-Kraida et al.[7] Abdominal guarding is not a sign that can be measured objectively and although it was significantly more common in the SA group, one should not put much weight in that. It is possible that the schistosomiasis played a role in the development of the acute appendicitis. The cause of acute appendicitis is generally considered to be an obstruction at the base of the appendix. An appendix affected by schistosomiasis shows considerable fibrosis that may have led to the obstruction.[8] However, 15% of our patients had symptoms that were not classical for acute appendicitis. The symptoms in these cases could be explained on the basis of low grade chronic inflammation solely due to schistosomiasis. The average age tended to be higher in the schistosomal group as has been described from Nigeria.[6] The predominance of male sex could be due to the fact that a majority of cases were Egyptian male workers from an endemic area who were employed as laborers in the region. A predominance of male sex has also been described by Adebamowo et al. and Al-Kraida et al.,[6,7] reflecting the occupational hazard. Therefore, SA should be suspected in patients coming from endemic areas, especially those with a history of recurrent abdominal pain, diarrhea, hematuria, blood in the stool and/or hepatosplenomegaly.[9] Leukocytosis was more commonly seen in NSA and although eosinophilia was seen more in the SA group, the difference was not statistically significant and therefore should not change the decision for appendectomy. The fibrosis associated with SA which may limit the spread of local inflammation may explain the low leukocyte count in this group. No ova could be seen in the urine or stool of cases of SA in which the results of urine and stool analysis were available, similar to the observation described from the Riyadh region.[7] This study shows that appendicitis could be the first manifestation of underlying schistosomal infestation that warrants treatment. Appendiceal schistosomiasis implies that patients may also have or may develop schistosomiasis in other intra-abdominal organs; the organ that is feared most is the liver.[10] Therefore, diagnosis of SA is unlikely before histopathological examination, similar to the findings of Hodasi and Adebamowo et al.[3,6] It is unfortunate that only nine of our patients received the antischistosomal treatment and thus could be saved from possible complications at a later stage. It is regrettable that the majority of patients did not receive the treatment, either because they were lost to

follow-up or the treatment aspect was overlooked. It is therefore important that the pathologist looking at the histological section should immediately communicate with the surgeon for institution of proper treatment.

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