

ISRAELI ARABS DEVELOP DIVERTICULITIS AT A YOUNGER AGE AND ARE MORE LIKELY TO REQUIRE SURGERY THAN JEWS

Árabes israelitas desenvolvem diverticulite em idade mais jovem e estão mais sujeitos ao tratamento cirúrgico do que os judeus

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ABSTRACT - Background: Only few studies have examined the impact of racial differences on the age of onset, course and outcomes of diverticulitis. **Aim:** To provide data about the epidemiology of diverticulitis in northern Israel, and to determine whether ethnicity is a predictor of age of onset, complications, and need for surgery. **Methods:** Was conducted a retrospective review of the charts of all patients diagnosed with a first episode of diverticulitis in our hospital between 2005 and 2012. **Results:** Were found 638 patients with a first episode of acute diverticulitis in the eight year interval. Israeli Arabs developed a first episode of diverticulitis at a younger age compared to Jews (51.2 vs 63.8 years, $p < 0.01$). Arabs living in rural areas developed diverticulitis at a younger age than Arabs living in urban centers (49.4 vs 54.5 years, $P = 0.03$). Jewish and Arabic men developed diverticulitis at younger age compared to their female counterparts (59.9 vs 66.09, $p < 0.01$, and 47.31 vs 56.93, $p < 0.01$, respectively). Arabs were more likely [odds ratio (OR)=1.81 ,95% confidence interval (CI)1.12-2.90, $p = 0.017$] than Jews to require surgical treatment (urgent or elective) for diverticulitis. **Conclusions:** Israeli Arabs tend to develop diverticulitis at a younger age and are more likely to require surgical treatment for diverticulitis compared to Jews. Arabs living in rural areas develop diverticulitis at a younger age than Arabs living in urban centers. These findings highlight a need to address the root cause for ethnic differences in onset, course and outcome of acute diverticulitis.

RESUMO - Racional: Somente poucos estudos examinaram o impacto das diferenças raciais na idade de início, curso e os resultados da diverticulite. **Objetivo:** Fornecer dados sobre a epidemiologia da diverticulite no norte de Israel, e determinar se a etnia é preditor de idade de início, complicações e necessidade de tratamento cirúrgico. **Métodos:** Foi realizado estudo retrospectivo dos prontuários de todos os pacientes diagnosticados com um primeiro episódio de diverticulite em nosso hospital entre 2005 e 2012. **Resultados:** Foram encontrados 638 pacientes com um primeiro episódio de diverticulite aguda no intervalo de oito anos. Os árabes israelenses desenvolveram o primeiro episódio de diverticulite em idade mais jovem em comparação com os judeus (51,2 vs 63,8 anos, $p < 0,01$). Árabes que vivem em áreas rurais a diverticulite foi desenvolvida em idade mais jovem do que os árabes que vivem em centros urbanos (49,4 vs 54,5 anos, $p = 0,03$). Homens judeus e árabes desenvolveram diverticulite em idade mais jovem em comparação com os seus homólogos do sexo feminino (59,9 vs 66,09, $p < 0,01$, e 47,31 vs 56,93, $p < 0,01$, respectivamente). Os árabes eram mais prováveis do que os judeus de necessitar de tratamento cirúrgico (urgência ou eletiva) para a diverticulite [odds ratio (OR)=1,81, intervalo de confiança de 95% (CI) 1,12-2,90, $p = 0,017$]. **Conclusões:** Os árabes israelenses tendem a desenvolver diverticulite em idade mais jovem e são mais propensos a necessitar de tratamento cirúrgico para a diverticulite em comparação com os judeus. Árabes que vivem em áreas rurais desenvolvem diverticulite em idade mais jovem do que os árabes que vivem em centros urbanos. Estes resultados destacam a necessidade de abordar a causa raiz para diferenças étnicas em início, o curso e o resultado da diverticulite aguda.

INTRODUCTION

Diverticular disease of the colon is a common disease with increasing prevalence in Western countries. The incidence of diverticular disease rises with age, and by the age of 85 about 65% of the population is expected to be affected²¹. It is less frequent in the younger age group, but the incidence of diverticulitis in younger patients appears to be on the rise^{10,22}. Most patients with diverticulosis will remain asymptomatic, and only 10-25% will go on to develop diverticulitis²¹. The clinical presentation of acute diverticulitis can vary widely, from mild inflammation to colonic perforation and peritonitis, yet most cases are mild and respond to antibiotic therapy.

The impact of ethnicity on the course and outcome of diverticulitis has not been studied extensively. Few studies addressing this issue have been recently performed in the United States, revealing that African American patients with diverticulitis are more likely to require urgent/emergent surgery^{1,20} and surgery for recurrent disease⁵, and are at increased risk for disease recurrence, morbidity and mortality^{1,16,20}. Data

regarding the epidemiology of diverticular disease in Israel is scarce and outdated, and the impact of ethnicity on disease course and outcome in Israeli patients has not been investigated.

There is conflicting data regarding the course and outcome of diverticulitis in young patients. While some studies reported a more severe course with a higher rate of complications in young patients with diverticulitis^{3,13}, other reports suggested a milder course, comparable to that in older patients^{12,26}.

The aim of this study was to performed a retrospective analysis of all patients hospitalized in our hospital with a first episode of acute diverticulitis during an 8-year period, and compared the course and outcome of diverticulitis in Arab patients to that of Jewish patients, and also make a similar comparison between younger and older patients.

METHODS

This study was carried out in accordance with the ethical standards laid down in the 1975 Declaration of Helsinki and its later amendments.

Patients

All patients hospitalized at our medical center with a first episode of acute diverticulitis between January 2005 to December 2012 were enrolled. Our patients' population included all patients diagnosed with acute diverticulitis in the emergency room, as our institution's policy is to hospitalize all patients with acute diverticulitis, regardless of disease severity.

Methods

The diagnosis of acute diverticulitis was based on typical clinical features, including lower abdominal pain (mostly left-sided), fever and leukocytosis. All patients underwent abdominal CT, and only those with characteristic findings on CT were included. Patients with a lesion suspicious of colonic cancer and patients with right-sided diverticulitis on CT scan were excluded. Patients with previous episodes of acute diverticulitis were excluded as well. Demographic characteristics, medical history, physical and radiographic findings as well as therapy were recorded.

Data was analyzed for the whole group, and then for subgroups according to ethnicity (Jewish vs. Arab) and age (<50 yr, >50 yr). The age of 50 years was chosen, as it was used in several previous studies addressing diverticulitis in young patients^{3,26}.

Statistical analysis

Began with descriptive statistics: means, standard deviations and ranges for diagnostic and outcome measures, then student's T-test and Fisher exact test were used to compare between the groups. Statistical significance was set as $p < 0.05$.

RESULTS

A total of 638 patients were hospitalized with a first episode of diverticulitis between January 2005 and December 2012. Of this total, 538 (84.3%) were Jews and 100 (15.7%) were Arabs; 253 were males and 385 females.

When analyzing patient age at first episode of acute diverticulitis (Table 1) was noted that Israeli Arabs developed a first episode of diverticulitis at a significantly younger age compared to Jews (51.2 vs 63.8 years, $p < 0.001$). Both Jewish and Arab men developed diverticulitis at a younger age compared to their female counterparts (Table 1).

TABLE 1 - Age (average±standard deviation) at first acute diverticulitis episode

		Jews	Arabs	p
Male	Age (n)	59.90±15.15 (194)	47.31±13.10 (59)	<0.01
Female	Age (n)	66.09±13.30 (344)	56.93±12.37 (41)	<0.01
	P	<0.01	<0.01	
Total	Age (n)	63.86±14.29 (538)	51.25±12.37 (100)	<0.01

Arabs living in rural areas developed diverticulitis at a younger age than Arabs living in urban centers (49.4 vs 54.5 years, $p=0.03$).

There was no significant difference between ethnic groups [odds ratio (OR)=1.10, 95% confidence interval (CI)=0.48-2.52, $P=1$] in the odds of requiring an acute intervention (urgent surgery or CT-guided percutaneous drainage) during their initial hospitalization with acute diverticulitis (Table 2). However, Arabs were significantly more likely [odds ratio (OR)=1.81, 95% confidence interval (CI) 1.12-2.90, $P=0.017$] than Jews to undergo surgical treatment at any stage (either urgent or elective) for diverticular disease (Table 3).

TABLE 2 - Need for acute intervention in first acute diverticulitis episode

	Jews	Arabs
Acute Intervention†	41	7
Conservative Treatment	497	93
p=1		

†Acute intervention – urgent surgery or CT-guided percutaneous drainage during initial hospitalization

TABLE 3 - Eventual need for surgical treatment for diverticular disease

	Jews	Arabs
Surgery†	107	31
No Surgery	431	69
p=0.017		

†Both urgent and elective surgeries

There was no difference in outcome when comparing younger (age <50 years) with older patients (age >50 years).

DISCUSSION

This study addresses the impact of race/ethnicity and age on the course and outcome of diverticulitis among Israeli patients. Was found that Israeli Arabs tend to develop diverticulitis at a younger age and are more likely to require surgical treatment for diverticulitis compared to Jews. Arabs living in rural areas develop diverticulitis at a younger age than Arabs living in urban centers.

Only few studies have examined the impact of race/ethnicity on presentation, course and outcome of diverticulitis. Most of these studies were conducted in the United States. It was suggested that African American patients are more likely than Caucasians to require emergent/urgent surgical treatment^{1,20} and surgical treatment for recurrent diverticulitis⁵. Risk for morbidity and mortality was also increased among African Americans^{1,16,20}. Some studies have suggested that insurance status, rather than race, is a risk factor for mortality in acute diverticulitis¹¹. However, a study comparing diverticulitis in African American and Caucasian Medicare patients revealed that African Americans were still at a higher risk for requiring urgent/emergent operation and mortality, thus suggesting that factors other than insurance status play a role in the worse outcomes observed in African American patients²⁰.

Israel has a social, government owned, health care

system, hence differences in insurance status between patients are minor/non-relevant. As a result we do not believe that insurance or socioeconomic status plays a major role in explaining our findings.

Very few data exists regarding the epidemiology of diverticulitis in Israel. Levy et al. studied the epidemiology of diverticulosis in Northern Israel in two consecutive studies, the first conducted in the early 1970's¹⁴ and the second a decade later¹⁵. They found a three-fold increase in the prevalence of diverticulosis among Sephardi Jews and a seven-fold increase in the prevalence of diverticulosis in Arab patients, while disease prevalence among Ashkenazi Jews remained stable during that 10 year period. These articles, however, studied the epidemiology of diverticulosis and not of diverticulitis, and were performed several decades ago, with no data regarding disease epidemiology among the different ethnic groups published in recent decades.

It is interesting to note that Arab patients comprised only 15.7% of this patient group. Our medical center mainly serves Israel's Haifa District and Northern District, which according to the Israeli Central Bureau of Statistics data for 2011 had Arabs making up 25.1% and 53.2% of their populations, respectively. While apparently having less of a risk of developing diverticulitis based on these data, those Arab patients who do develop diverticulitis have a significantly more severe disease course, as shown above.

Our findings regarding the impact of place of residence on the development of diverticulitis were somewhat surprising. Burkitt's "fiber hypothesis", suggesting that a lack of dietary fiber predisposes individuals to diverticular disease^{6,7,18}, has long been accepted in explaining the pathogenesis of diverticular disease. Rural population in general, and the rural Arab population in particular, is generally thought to consume higher amounts of dietary fiber than urban population. However, in this study the subgroup of rural Arab patients developed diverticulitis at a significantly younger age than their urban Arab counterparts. This might suggest that factors other than dietary fiber could also play a role in the development of diverticular disease.

There is conflicting evidence regarding the natural course of diverticulitis in young patients. Some studies have reported that young patients have a more severe course with a higher complication rate, thus suggesting that an earlier surgical approach should be considered in young patients with acute diverticulitis^{2,3,8,9,13,17,19}.

Others, however, found that the course of diverticulitis in young patients is not different from that in the general population, hence suggesting young patients should be managed in a similar fashion to older ones^{4,10,12,22,23,24,26}. This study also failed to demonstrate a difference in disease course, complication rate and outcome between younger and older patients. Further research is needed in order to clarify this matter of debate. It is worth noting that a male predominance was seen in our young patient group, a pattern also noted in past studies^{4,12,13}.

This study has several limitations. First, it is a retrospective study, and prospective studies regarding the impact of epidemiological factors on the course and outcome of diverticulitis are needed, in order to further investigate the matter and confirm our findings. In addition, the study is a single-center study, and thus our group of patients may not be fully representative of the entire Northern Israeli population, which is served by several medical centers, let alone the whole state of Israel. Larger scale studies, perhaps even on a national scale, could lead to more robust and comprehensive evidence.

CONCLUSION

We were able to demonstrate that Israeli Arabs are more

likely to develop diverticulitis at a younger age and to require surgical treatment for diverticulitis compared to Jews. Future research should focus on identifying the root causes for these differences. Our data presents a rationale for very careful follow-up of Israeli Arab patients following medical treatment for diverticulitis.

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