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## RESEARCH ARTICLE

### EXPERIENCE OF SIGNIFICANT SPLENIC INFARCTION AT UNIVERSITY HOSPITAL; CASE SERIES

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#### ABSTRACT

**Objective:** The aim of this study is to identify the causes of significant splenic infarction at King Fahd university hospital, Saudi Arabia over a 13 year period.

**Methods:** A retrospective chart review of patients who were diagnosed with significant splenic infarction during a 13-year period at King Fahd university hospital, Saudi Arabia was conducted. Only computerized tomography proven diagnoses of splenic infarction were included. The clinical presentation and initial investigations were recorded.

**Results:** We found 14 cases of acute significant splenic infarction. Sickle cell disease was the most common cause (seven cases, 50%). Two cases secondary to atrial fibrillation (14%), one case secondary to Wagner granulomatosis (7%), one case secondary to acute pancreatitis (7%), one case secondary to liver cirrhosis and hypersplenism (7%), one case secondary to aortic dissection (7%) and one case secondary to thalassemia major (7%). All of the reported cases of significant splenic infarction presented with left abdominal pain. 43 % of the cases had leukocytosis and 71 % had elevated Lactate dehydrogenase (LDH). 29% of cases were managed surgically and 71 % were managed medically.

**Conclusion:** the percentage of significant splenic infarction in our institution is very low. This is could be attributed to low doctors awareness and high threshold of computerized tomography imaging of such serious medical problem. This might result in missing a lot of cases. Sickle cell disease remain the most common cause due to epidemiological reasons. We recommend maintaining high clinical suspicion of splenic infarction in high risk group who came with left upper quadrant pain.

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#### INTRODUCTION

Splenic infarction is not uncommon cause of acute left upper quadrant abdominal pain and fever in patients who have underlying hematologic or thromboembolic disorders. However, a small subset of patients remains asymptomatic up to 50 % of cases. Splenic infarction is often incidentally identified on imaging studies obtained for other reasons. The etiological factors of splenic infarctions include Hematologic disorders such as sickle cell disease and malignant lymph proliferative disorders. Also Thromboembolic etiologies typically include atherosclerotic disease or emboli originating from the heart, as in endocarditis or atrial fibrillation, or are secondary to prosthetic mitral valves. In addition to other rare causes like pancreatitis, vasculites, Wagner granulomatosis and antiphospholipid syndrome.

#### Patients and methods

This is a retrospective chart review of patients who presented to the department of emergency medicine (ED) and were discharged from King Fahad university hospital-Saudia Arabia, with a discharge diagnosis of splenic infarction between January 2000, and March 2013. The average age of patients (16-80 years). Demographics details, subjective complaints, finding on physical examination, results of investigation, and final diagnosis were obtained from in patient chart. Available imaging studies were reviewed and reported. Other splenic

disorders like trauma, abscess or incidental splenic infarction were excluded. Absence of proven splenic infarction on computerized imaging were excluded too. We defined significant splenic infarction as a clinical significant acute abdominal pain with documented acute splenic infarction on radiological scan.

#### RESULTS

By using hospital computer system under code of splenic disorders, forty eight patients were collected (48). Out of that thirty four charts were excluded because of our strict exclusion criteria (34). Five cases (5/34) were splenic abscess. Nine cases (9/34), the radiological diagnosis is not definitive. And twenty cases (20/34) were due to incidental findings for other reasons. We found 14 cases of significant splenic infarction. Seven cases were secondary to sickle disease who presented with severe abdominal pain. Two cases were secondary to chronic atrial fibrillation and possible thromboembolism. One case was secondary to Wagner granulomatosis. One case was secondary to liver cirrhosis and hypersplenism. One case was secondary to acute aortic dissection. And one case was secondary to severe acute pancreatitis which discovered because of persistent left upper quadrant pain after resolving of the pancreatitis. 43 % of the reported cases had leukocytosis and 71 % had elevated LDH. Sickle cell disease is the most common cause of splenic infarction in our review due to epidemiological reason and possible more doctor's awareness. In our review all cases of splenic infarction at young age occurred in sicklers. The most common clinical presentation of this case series is left upper quadrant abdominal pain. Four case were managed surgically and 10 cases were managed medically.

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**Table 1. Causes and clinical features of patients diagnosed with splenic infarction**

Case#	Age	Gender	Presenting complaint	Chronic medical conditions	New diagnosis	Management
1	16	F	LUQ & abdominal pain	Thalassemia major	DCM	C
2	19	M	Nausea & vomiting	SCD, G6PD	-	S
3	21	F	LUQ & abdominal pain	SCD	-	S
4	22	M	LUQ & abdominal pain	SCD	-	S
5	28	M	Diffuse abdominal pain	SCD	-	C
6	32	M	LUQ & abdominal pain	SCD	-	C
7	38	M	Generalized body weakness	Granulomatosis with polyangiitis	RP	C
8	40	F	epigastric abdominal pain	SCD	-	S
9	40	M	Back pain& fever	SCD	-	C
10	58	M	LUQ & abdominal pain	HTN, AF, Hyperthyroidism	-	C
11	61	M	LUQ & abdominal pain	HTN, T2DM, HBV, myelofibrosis, Aortic dissection	-	C
12	63	F	Epigastric&abdominal pain	HTN, DM II	Acute pancreatitis	C
13	67	M	Diffuse abdominal pain	HBV, Liver cirrhosis	Hyper-splenism	C
14	82	M	Knee swelling & pain	HTN,DM II, AF, Ischemic Stroke, MDS, PD		C

LUQ = left upper quadrant, SCD = sickle cell disease, G6PD = glucose-6 phosphate dehydrogenase deficiency, HTN = hypertension, T2DM = type 2 diabetes mellitus, HBV = hepatitis B infection, MDS = myelodysplastic syndrome, PD = parkinson’s disease, DCM = dilated cardiomyopathy, RP = relapsing polychondritis

**Table 2. Demographics and clinical features of the cases**

Demographics		
Mean age	(16 – 82)	
Male/ total	10/14	71 %
Female / total	4/14	29 %
Presenting symptoms		
Left upper quadrant pain	6/14	43%
other abdominal pain	4/14	29 %
Absence of abdominal pain	3/14	22 %
Nausea & vomiting	1/14	8 %
Blood test		
White blood count>12.000/dl	6/14	43 %
Lactate dehydrogenase> 250	10/14	71 %
Imaging		
Infarcts seen by CT	14/14	100 %
Outcome		
Splenectomy	4/14	29%
Inpatient mortality	0	0

**Table 3. Etiology of splenic infarction**

Underlying cause	Total no. of cases	New underlying diagnosis
SCD	7	0
Thalassemia		1
Cardiac disease	3	0
Acute pancreatitis	1	0
Liver cirrhosis	1	1
Vascular disease	1	1
Total	14	3

The middle column represents the total number of cases attributable to that cause, the right column represents the subset of cases in which the underlying condition was diagnosed subsequent to the patient presenting with splenic infarction.

**DISCUSSION**

Due to the high prevalence of sickle cell disease in our community [2], it was by far the most common underlying etiology of splenic infarction. These findings are consistent with other international observational studies and emphasize the prothrombotic state that those patients suffer from (1, 2). One large previous report of splenic infarction was conducted by Yaakov and his colleague and they reported 28 cases of splenic infarction over a 10 years period and more than 50 % of these cases were discovered by chance. There is no similar studies that has been conducted in Saudi Arabia up to our knowledge. Other causes of splenic infarction like atrial fibrillation with showering is quite common (4), infective endocarditis with septic emboli, vasculitis, myelodysplastic syndrome, myeloproliferative with hyperviscosity, acute pancreatitis and others all are reported in multiple case reports and studies ( 4-8 ).

We think that the real prevalence of clinically significant splenic infarction is more than what has been reported in the literature. This could be attributed to low doctor’s awareness of the importance of this serious medical problem and could be a concern of exposing sick patients to radiation. Correlation between clinical and radiological presentation of splenic infarction is important to dictate the management since a lot of cases is discovered by chance due to imaging for other reasons. In our review 58% of the cases were excluded because of the incidental findings. Acute pancreatitis as cause of splenic infarction is extremely rare and the pathogenesis is not clear yet. In our series we reported one case of massive splenic infarction secondary to acute severe pancreatitis that was managed medically.

**Conclusion**

Sickle cell disease by far still the most common cause of splenic infarction in our institution, however other rare causes should be considered such as Wegner’s granulomatosis, acute pancreatitis and myelodysplastic syndrome. Physician should maintain high clinical suspicion of such serious medical problem. Correlation between clinical and radiological factors are fundamental to avoid over treatment of silent non-significant splenic infarction.

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