WEST AFRICAN JOURNAL OF MEDICINE

ORIGINAL ARTICLE

The Import of Abdominal Pain in Adults with Sickle Cell Disorder

L'importation de la douleur abdominale chez les adultes avec des troubles de la drépanocytose

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ABSTRACT

BACKGROUND: **The aetiology, clinical correlates and outcome of abdominal pain in Nigerian adults with sickle cell disorder (SCD) have not been extensively reported.**

OBJECTIVE: **To determine the prevalence of abdominal vaso-occlusive crisis in sickle cell patients with abdominal pain and their clinical correlates if any.**

METHODS: **Clinical records of adults with SCD (Hb SS and Hb SC) attending the Haematology Outpatients' Clinic of the Obafemi Awolowo University Teaching Hospitals Complex, Southwest Nigerian, over a ten-year period, were reviewed. Demographic, clinical and laboratory data with respect to abdominal pain were retrieved. Data were analysed using appropriate descriptive and inferential statistics.**

RESULTS: **A total of 154 records (128 Hb SS and 26 Hb SC) were available for assessment. The patients mean ages were 22.5 ± 7.3 years (Hb SS patients) and 24.2 ± 9.7 years (Hb SC patients) (p > 0.05). The prevalence of abdominal pain was 39.1% and 30.8% in Hb SS and Hb SC respectively (p > 0.05). Pain was commonly in the epigastrium; dull in 35% Hb SS, but peppery/burning in 37.5% Hb SC. All patients with abdominal vaso-occlusive crisis (VOC) had diffuse/generalised dull abdominal pains. A diagnosis of gastritis/peptic ulcer disease was made in 50% of Hb SC patients and 28% of Hb SS patients. Abdominal VOC was diagnosed in 26% Hb SS, but none in Hb SC patients. The size of the liver or spleen and the haematocrit of Hb SS patients did not correlate with the frequency of abdominal pain generally or abdominal VOC specifically.**

CONCLUSION: **The prevalence rates and patterns of abdominal pain in Hb SS and Hb SC patients appear similar. Abdominal VOC characterised by diffuse/generalised dull abdominal pain occurred in only Hb SS patients and may be a marker of disease severity in these patients. WAJM 2009; 28(2): 83–86.**

Keywords: **Abdominal pain; vaso-occlussive crisis; adult; sickle cell anaemia; peptic ulcer disease, gastritis, cholelithiasis.**

RÉSUMÉ

CONTEXTE: *L'étiologie, les corrélats cliniques et le résultat des douleurs abdominales au Nigeria adultes avec trouble de la drépanocytose (SCD) n'ont pas été signalés.*

OBJECTIF: *déterminer la prévalence de l'abdomen crise vaso-occlusive de la drépanocytose de patients avec des douleurs abdominales et de leurs corrélats cliniques éventuelles.*

MÉTHODES: *cliniques d'adultes avec SCD (Hb SS et Hb SC) Hématologie externes participant à la «Clinique de la Obafemi Awolowo University Teaching Hospitals Complex, sud-ouest du Nigeria, sur une période de dix ans, ont été examinés. Démographiques, cliniques et de laboratoire des données relatives à des douleurs abdominales ont été récupérées. Les données ont été analysées à l'aide appropriée de statistiques descriptives et inférentielles.*

RÉSULTATS: *Un total de 154 dossiers (128 Hb Hb SS et 26 SC) sont disponibles pour l'évaluation. L'âge moyen des patients était 22,5 ± 7,3 ans (Hb SS patients) et de 24,2 ± 9,7 ans (Hb SC patients) (p> 0,05). La prévalence de la douleur abdominale a été 39,1% et 30,8% en Hb et Hb SS SC respectivement (p> 0,05). La douleur a été présente dans l'épigastre; terne dans 35% Hb SS, mais poivré / brûlure dans 37,5% Hb SC. Tous les patients avec abdominale crise vaso-occlusive (VOC) a diffuses, des douleurs abdominales généralisées terne. Un diagnostic de gastrite / maladie ulcéreuse gastro-duodénale a été faite dans 50% des patients Hb SC et de 28% de l'Hb SS patients. Abdominal COV a été diagnostiquée chez 26% Hb SS, mais aucune en Hb SC patients. La taille de la rate et du foie ou de l'hématocrite Hb SS patients n'ont pas de corrélation avec la fréquence des douleurs abdominales en général ou en particulier abdominale COV.*

CONCLUSION: *Le taux de prévalence et les caractéristiques de la douleur abdominale en Hb et Hb SS SC patients semblent similaires. Abdominal COV caractérisés par diffuses, des douleurs abdominales généralisées terne eu lieu dans seulement Hb SS patients et mai être un marqueur de la sévérité de la maladie chez ces patients.* ***WAJM 2009; 28(2): 83–86.***

Mots-clés: *douleur abdominale, la crise vaso-occlussive; adulte; drépanocytose, l'ulcère gastro-duodénal, gastrite, lithiase biliaire.*

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Abbreviations: Hb, haemoglobin; **Hb SC,** haemoglobin SC disease; **PCV,** packed cell volume; **PUD,** peptic ulcer disease; **SCA,** sickle cell anaemia (Hb SS); **SCD,** sickle cell disorder(s); **VOC,** vaso-occlusive crisis

INTRODUCTION

The aetiology and outcome of abdominal pain in individuals with sickle cell disorder (SCD) vary from patient to patient. Abdominal pain may be due to a definite pathology within the abdomen e.g. peptic ulcer disease,[1] cholelithiasis,[2–5] cholecystitis,[6] viral hepatitis [7-10] and other infective processes or it may be due to pain referred from elsewhere such as the lungs, ribs, spine and hips. When abdominal pain is not due to any specific intra-abdominal pathology in sickle cell patients, it is termed abdominal painful crisis resulting from vaso-occlusive effects of mesenteric arterial[11,12] or portal vein thrombosis.[13] The aetiology of abdominal pain in the sickle cell patient is multifactorial. Most of the previous studies have been predominantly in children and adolescents. The prevalence of these aetiological factors and the interaction between certain clinical features in adult patients have not been extensively reported.

MATERIALS AND METHODS

Medical records of adults with Hb SS or Hb SC attending the Haematology Outpatients' Clinic of the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, over a ten-year period (1996-2005) were reviewed. Obafemi Awolowo University Teaching Hospitals Complex is located in southwestern Nigeria and provides health care services to people from the five states that surround it and to those that have been referred from other parts of Nigeria. It is a 600-bedded hospital located in a town with a population of about 750,000. Southwestern Nigeria is in the rain forest where malaria is endemic and the language of the indigenes is Yoruba.

Information with respect to the following was obtained: demographic data; haemoglobin electrophoresis pattern; frequency of vaso-occlusive crisis (VOC) per year; frequency of abdominal pain per year, location and character of abdominal pain; liver and spleen size in the steady state and packed cell volume (PCV). Data were analyzed using means and standard deviations (SD); Student's t-test; Chi-squared test; and correlations. P-values = 0.05 were considered statistically significant.

RESULTS

A total of 154 patients were reviewed and observed to have a mean age of 22.8 ± 7.7 years and M: F ratio of 1:1.1. One hundred and twenty eight (83.1%) patients had Hb SS and 26 (16.9%) had HbSC. There was no significant difference in the ages and sex distribution of these patients (Hb SS 22.4 ± 7.3 years; 1:1 and Hb SC 24.2 ± 9.7 years; M: F 1: 1.4; $p > 0.05$; Table 1). Majority of patients, that is, 115 Hb SS (89.8%) and 22 Hb SC (84.6%) had four or fewer vaso-occlusive crises (VOC) per year ($p > 0.05$). Sickle cell anaemia patients had a significantly lower PCV (23 ± 3.7%) than Hb SC patients (29.1 ± 3.8%; $p < 0.01$) in the steady state. Evidence of abdominal pain was documented in 50 (39.1%) Hb SS patients and eight (30.8%) Hb SC ($p > 0.05$).

Table 1: The Demographic Data of Hb SS and Hb SC Patients and the Frequency of Vaso-occlusive Crisis in those with Abdominal Pain per Year

Hb Type	Number of cases reviewed	Mean Age (yrs) ± SD	M: F ratio	Number of Vaso-occlusive Crisis per Year				
				1–2	3–4	>4	Unknown	Total
Hb SC	26	24.2 ± 9.7	1: 1.4	2(25%)	4(50%)	0	2(25%)	8(100%)
Hb SS	128	22.4 ± 7.3	1: 1	19(38%)	12(24%)	7(14%)	12(24%)	50(100%)
Total	154	22.8 ± 7.7	1: 1.1	21	16	7	14	58

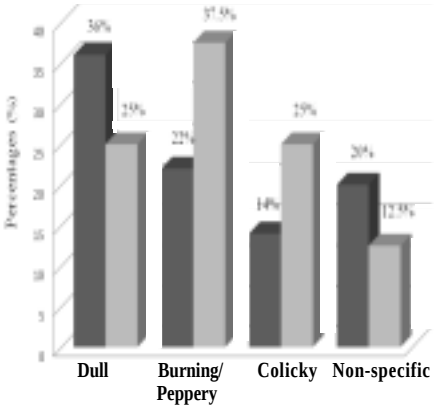

Figure 1: Comparison of Character of Abdominal Pain in Patients with Sickle Cell Disease ■ **SS** ■ **SC**

Frequency of Abdominal Pain

The frequency of abdominal pain as documented in 38(76%) patients with Hb SS and 6(75%) with Hb SC is shown in Table 1. Of these, 31(81.6%) Hb SS patients and all the six patients with Hb SC had less than five episodes per year.

- The frequency of abdominal pain per year in Hb SS patients was not different from that of Hb SC patients ($p > 0.05$). However, 14% of Hb SS, but none of the Hb SC patients, had more than four episodes of abdominal pain per year and in 25% of patients from each group the frequency of abdominal pain was unknown.

Character and Location of Abdominal Pain

Figure 1 shows the frequency of the character of the abdominal pain experienced by the patients. Abdominal pain was predominantly dull in 18(36%) Hb SS and two (25%) Hb SC patients, while burning or peppery pain occurred in 11(22%) Hb SS and three (37.5%) Hb SC patients. Colicky abdominal pain occurred in seven (14%) Hb SS and two (25%) Hb SC patients, while pain was non-specific in 10(20%) Hb SS and one (12.5%) Hb SC patients. Table 2 shows that the epigastrium was the commonest site of abdominal pain in 18 (36%) Hb SS and four (50%) Hb SC patients, followed by a diffuse/generalized location which occurred in 14(28%) and one (12.5%) of Hb SS and Hb SC patients respectively. The site was unknown in 12(24%) of Hb SS and three (37.5%) of Hb SC patients. Hypochrondrial and suprapubic pain did not occur in Hb SC patients. The 11 patients with Hb SS who had abdominal VOC all presented with dull, diffuse/generalized abdominal pain and one had colicky pain in addition. Dull pain due to abdominal VOC accounted for 61% of all

Table 2: Location of abdominal pain in Hb SS and Hb SC patients

Location of Pain	Number (%)	
	Hb SS	Hb SC
Epigastrium	18(36)	4(50)
Diffuse/Generalised	14(28)	1(12.5)
Suprapubic	3(6)	0
Rt. Hypochondrium	2(4)	0
Lt. Hypochondrium	1(2)	0
Unknown	12(24)	3(37.5)
Total	50(100)	8(100)

Table 3: Relationship between some Clinical Features and Occurrence of Abdominal Pain in Sickle Cell Disease

Feature	Mean (SD)	
	Pain	No Pain
HbSS		
Number	**50**	**78**
PCV(%)	22.7(3)	23.2(3.7)
Liver size (cm)	7.4(4.7)	8.1(4.3)
Speen size (cm)	6.5(3.1)	9.9(6.4)
HbSC		
Number	8	18
PCV(%)	30.3(4.6)	28.6(3.5)
Liver size (cm)	–	7.0(1.7)
Speen size (cm)	7.0	5.8(2.1)

Differences were not statistically significant.
* only one patient

cases of dull abdominal pain in Hb SS patients and the diffuse/generalized location accounted for 78.6% of such location in the same group of patients.

Associated Clinical Features in the Steady State

In the steady state of 50 (39.1%) Hb SS patients with pain and the 78 patients (60.9%) without pain the PCV (22.7 ± 3.0% and 23.2 ± 3.7% respectively), liver size (8.1 ± 4.7 cm and 8.1 ± 4.3 cm respectively) and spleen size (6.5 ± 3.1cm and 9.9 ± 6.4 cm respectively) did not vary significantly (Table 3). Generally there was no gender variation in the PCV of these patients (22.7 ± 3.4% and 22.7 ± 2.6% for males and females respectively). Hepatomegaly occurred in 45 (35.2%) patients, 18 (36%) had pain and 27 (34.6%) did not have pain. Splenomegaly occurred in 22 (17.2%) patients, 11 (22%) had pain and 11 (14.1%) did not have pain. Analysis of the same clinical features in Hb SC patients showed that those with or without abdominal pain had a mean PCV of 30.3 ± 4.6% and 28.6 ± 3.5% respectively; liver size was not palpable (0 cm) and 7.0 ± 1.7 cm respectively; and spleen size was 7.0 cm and 5.8 ± 2.1 cm respectively (Table 3). The number of patients in these sub-groups was too small to assess significance of gender variation in PCV. Hepatomegaly occurred in three (15.4%), all three had abdominal pain and splenomegaly occurred in five (19.2%) patients, one (12.5%) had pain and four (22.2%) did not. The population size for these sub-groups was too small to be subjected to statistical analysis. The steady state PCV decreased with increasing liver size in Hb SS patients and the correlation was stronger in patients without abdominal pain than those with pain ($r = -0.37$; $p < 0.001$ and -0.30) respectively.

Aetiology of Abdominal Pain

Table 4 shows the aetiology of abdominal pain in both Hb SS and Hb SC patients. In SCA these included peptic ulcer disease (PUD) in 14 (28%); abdominal VOC in 11 (26%); hepatopathy in five (10%); enteritis in three (6%); cholelithiasis in three (6%); menstruation-related pain in two (4%) being 8% of Hb SS female patients; and other diagnoses such as splenic abscess, appendicitis and cystitis for example. In Hb SC patients, PUD occurred in four (50%) of cases, enteritis in two (25%); hepatopathy in one (12.5%); and multiple splenic abscess in one (12.5%). Pains due to abdominal VOC and cholelithiasis did not occur in these patients and neither was menstruation-related pain observed in the four female Hb SC patients. The 11 Hb SS patients with abdominal VOC had a mean PCV of 22.6 ± 2.3%. Seven (63.6%) of them had no organomegaly, whilst two (18.2%) had hepatosplenomegaly. These data are similar to those of patients without abdominal pain.

Table 4: Aetiology of Abdominal Pain in Patients with Sickle Cell Disease

Cause	Number (%)	
	Hb SS	Hb SC
PUD/Gastritis	14 (28)	4 (50)
Abdominal VOC	11 (26)	0
Hepatopathy	5 (10)	1 (12.5)
Enteritis	3 (6)	2 (25)
Cholelithiasis	3 (6)	0
Menstruation related	2 (4)	0
Others	12 (24)	1 (12.5)

PUD, peptic ulcer disease; VOC, vaso-occlusive crisis

Mode of Management and Outcome

Majority of patients with either Hb SS (68%) or SC (75%) were treated as out-patients in the day ward. The rates of hospital admission for abdominal pain in SCD were similar in both groups of patients ($p > 0.05$). All patients in this study with abdominal pain recovered with the exception of an Hb SC patient who had multiple splenic abscesses.

DISCUSSION

The study population consisted mainly of young adults who dominated the sickle cell clinic. The prevalence rate and pattern of abdominal pain in Hb SS patients mirrored that of Hb SC patients (although HbSC patients were fewer). The frequency of abdominal pain in this study was similar to that obtained among Ghanaian patients,[14] in whom it occurred in one of three patients with HbSS and one of four patients with Hb SC. Abdominal pain was predominantly dull in HbSS patients and occurred more in the epigastrium in both groups of patients, suggesting PUD or gastritis. This was confirmed by endoscopy in a few patients and the frequent use of non-steriodal anti-inflammatory drugs (NSAIDs) for pain management was implicated. This observation is similar to that of Lee *et al* [1] but contrary to the Ghanaian study[14] that reported the prevalence rate of PUD to be 2% and the most common location of pain was generalized in both Hb SS and Hb SC patients alike. Further studies are needed to confirm the aetiology of epigastric pain in this cohort of patients.

Abdominal VOC occurred in 25% Hb SS patients, but in none of the Hb SC patients. Since Hb SC patients have a milder illness than Hb SS patients, this

result suggests that the abdominal VOC in the adult Hb SS individual may be a marker of disease severity. The character and location of abdominal pain in the Hb SS patients with abdominal VOC in this study suggest that abdominal VOC is more likely to present clinically with dull and diffuse/generalized abdominal pain than any other type of pain. However not all dull abdominal pain is due to VOC and no other clinical variable assessed in this study was able to distinguish between abdominal VOC and other causes of abdominal pain. The prevalence of abdominal VOC in Hb SS in this study is less than that reported by Serjeant *et al* [15] who also observed that abdominal VOC occurred equally among younger and older patients contrary to previous clinical impressions.

Cholelithiasis was not documented in Hb SC, but had a prevalence rate of 6% in Hb SS patients who presented with abdominal pain in this study. This finding is in agreement with previous reports by other authors from Nigeria.[2,3,16] The prevalence rate obtained in this study may be higher if asymptomatic patients (without abdominal pain) were included after abdominal ultrasonography to rule in or rule out cholilethiasis.

The PCV in the steady state was significantly higher among patients with Hb SC than Hb SS as expected ($p < 0.01$), but it was unable to distinguish between patients with or without abdominal pain in the two groups ($p > 0.05$). The PCV was also unable to distinguish those who had abdominal VOC from those with other causes of abdominal pain. There was no sex variation in the PCV values for males and females with Hb SS contrary to observations among individuals with Hb AA or AS. The presence of hepatomegaly was more unlikely to be related to abdominal pain in both groups of patients, but splenomegaly however tended to be equally prevalent in both Hb SS and Hb SC patients with or without pain. The size of the liver and the spleen, in the steady state of Hb SS patients, did not distinguish between those who developed abdominal pain from those who did not. The import of a stronger inverse correlation between the PCV and the size of the liver in Hb SS patients without abdominal pain is not clear, because there was no significant difference in the mean values for PCV and the liver size for both groups of patients in this study.

All patients with abdominal pain recovered with the exception of an Hb SC patient who had multiple abscesses in the spleen and died of overwhelming sepsis.

CONCLUSION

The prevalence rate and pattern of abdominal pain appear to be similar in Hb SS and Hb SC patients. The epigastrium was the commonest location and PUD/ gastritis was the commonest cause in both Hb SS and Hb SC patients and chronic use of NSAIDs has been implicated. Abdominal VOC occurred in 25% Hb SS patients but in none of the Hb SC patients and may therefore be a marker of disease severity. The PCV, liver and spleen size in the steady state do not appear to be predictors of abdominal pain or abdominal VOC in this cohort of patients, but dull and diffuse/generalised pain is more likely to be associated with abdominal VOC than any other aetiology. The outcome of management is generally good.

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