

SICKLE CELL PAIN CRISIS IN ADULTS: AN ASSESSMENT OF THE MANAGEMENT BY MEDICAL PRACTITIONERS IN NIGERIA.

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ABSTRACT

Background: Sick cell pain crisis is a common medical emergency in Nigeria. The treatment approach to this common problem is known to vary amongst medical practitioners.

Subjects and Methods: A cross-sectional survey of one hundred and seventy-four medical practitioners was carried out using a questionnaire. They were interviewed concerning their mode of treatment of sickle cell pain crises. Information obtained included professional qualification and date, field of specialization, number and severity of pain crises attended to, choice of analgesics in pain crises, type and quantity of fluid, use of anti-malarial drugs and antibiotics in pain crises.

Results: Their experience ranged from 2 to 34 years. 65 (37.6%) were within 5 years and 108 (62.4%) were more than 5 years post-qualification. 70-80% of these doctors would give appropriate strength of analgesics for the various grades of severity of pain. 32 of 163 (18.4%) would however not prescribe narcotic analgesics even in severe pain crises, for various reasons. As many as 38 of 174 (24.2%) would give inadequate quantity of fluid and 18 of 124 (14.6%) will not give antibiotics even in the presence of markedly elevated white blood cell count. 45 of 90 (50%) will give anti-malarial drugs routinely. Others will give anti-malarial drugs only if there is fever. None of the doctors will insist on a laboratory demonstration of malaria parasitaemia before giving anti-malarial drugs. There was no statistically significant difference in the management of pain crisis by doctors who were within 5 years when compared with those above 5 years post-qualification.

Conclusion: Although, 70-80% of the doctors manage pain crises appropriately, it would be desired that all doctors manage sickle cell pain crises properly. To achieve this, a pain management protocol may be introduced in order to ensure that every sickle cell pain crisis is appropriately and consistently managed.

Key words: Sick cell, pain, crisis, acute complications and management.

INTRODUCTION

Sickle Cell Disease (SCD) is the commonest inherited disorder in Africa. The majority of the affected people carry the haemoglobin genotype SS (HbSS). This is so much so that 89% of the 231,000 live births with HbSS in the world are born in Sub-Saharan Africa¹. Although the exact population of HbSS in Nigeria is not known, it is known that about 25% of the estimated 120million population carry the sickle cell trait (HbAS) and 2% of newborn babies carry the genotype Hb SS. It is therefore most likely to be correct to say that Nigeria has the largest population of HbSS in the world².

Many of these patients present with acute complications, of which the pain crisis is the commonest and the most distressing³. About 60% of SCD patients have had at least one episode of pain crisis in any given year⁴. In Britain, pain crises accounted for 142 out of 161 (82%) acute admissions⁵ while in Nigeria, 39 of 60

(65%)⁶ and 35 of 102 (34%)⁷ acutely ill children and adults with Hb SS respectively had pain crises.

The natural history of pain crisis could be influenced by the modalities of treatment employed and these vary amongst medical practitioners from one place to the other^{8,9}. Considering the large population of patients with SCD and the frequency of pain crises, many doctors practicing in Nigeria may have to treat episodes of pain crises at some point in time. Therefore this study was carried out to examine some aspects of the practice of medical practitioners with reference to pain crises in SCD patients. It is our belief that the study will provide information as well as deficiencies in the management of sickle cell pain crisis.

SUBJECTS AND METHODS

One hundred and seventy-four medical practitioners were interviewed concerning the management of sickle cell pain crisis. The information was obtained using a standard questionnaire that was applied by the first author. The medical practitioners

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were either at a scientific conference, pre-employment interview in Lagos or visited in their hospitals in the urban Lagos from October 2000 to March 2001. The doctors interviewed included General Practitioners, Specialist Physicians or Haematologists. General Practitioners are those doctors without a special training in Internal Medicine or Haematology. Specialist physicians were doctors with postgraduate training in Internal Medicine, whether they practice in specialist or private hospitals. Specialists in other fields (Paediatrics, Surgery, Obstetrics and Gynaecology etc) were excluded. Information concerning professional qualifications, date and duration of practice as well as field of specialisation were obtained. Their practice concerning analgesic use, importance of fluid therapy as well as the quantity of fluid, use of antimalarials and antibiotics in pain crisis were obtained.

The information was computed using a statistical computer software (SPSS, version 10). Chi Square test was used to compare parametric data and Students-t test for comparison of means. Statistical significance level was taken as $p < 0.05$.

RESULTS

One hundred and seventy-four medical practitioners were interviewed. The duration of practice ranged from 2 years to 34 years, with a mean of 8.62 years \pm 5.72. 65 (37.6%) were less than 5 years qualified while 108 (62.4%) were more than 5 years (Figure 1). 143 (82.2%) were General Practitioners (GP), 20 (11.5%) were Physicians and 11 (6.3%) were Haematologists (Figure 2).

Figure 1: Duration of Medical Practice of 173 Doctors Managing Pain Crisis

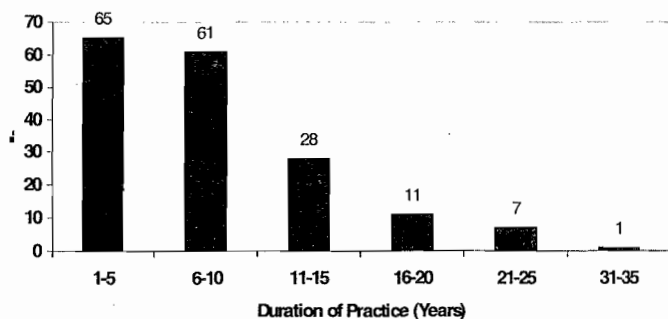
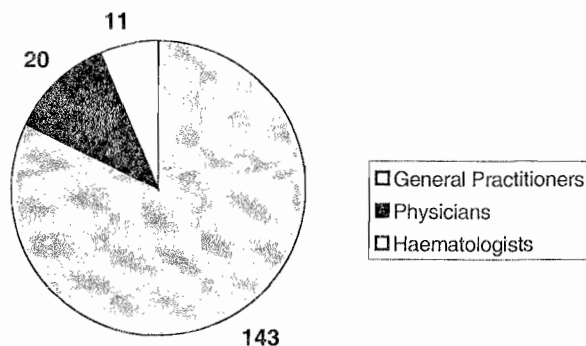


Figure 2: Field of Specialisation of 174 Medical Doctors Managing Sickle cell Pain Crises



He admitted to seeing at least one Hb SS patient per year with a range of 1 to 1000, mean of 58.1 \pm 145). The number of episodes of pain crises ranged from 1 to 500 and a mean of 28.60 \pm 53.98. 138 doctors attend to between 1 and 90 episodes of mild pain crises (mean 31.1 \pm 20.42). 145 attend to between 1 and 90 patients with moderate pain crises (mean, 37.91; \pm 19.61) while 146 attend to 2 to 100 episodes of severe pain crises (mean 36.49; \pm 27.92) (Table 1). There was no statistically significant difference between the numbers of patients seen by doctors who are within five years in practice when compared to those who are longer. ($p=0.360$) (Table 2).

Table 1: Severity Of Episodes Of Pain Crises

	No of Doctors	Range of episodes of pain crises treated	Average No. of episodes	sd
Mild pain	138	1-90	31.1	20.42
Moderate pain	145	1-90	37.9	19.61
Severe pain	146	2-100	36.5	27.92

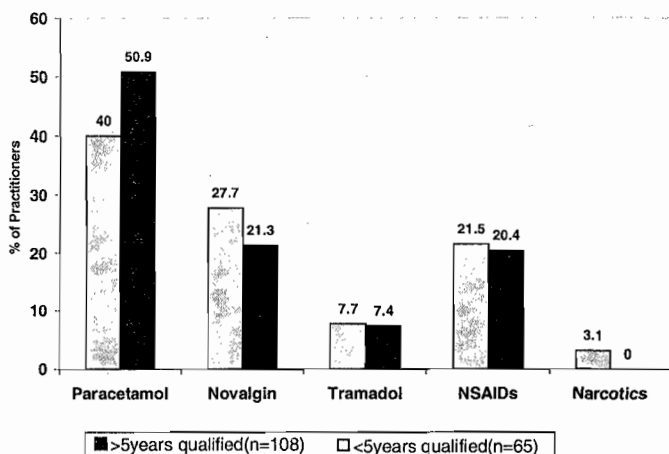
Table 2: Comparison of Episodes of Pain Crises Treated by the Categories of Doctors

	≤ 5 years qualified			> 5 years qualified			p-value
	No of Doctor p-value	Average no. of pain crises treated	s.d	No of Doctor p-value	Average no of episodes of crises treated	s.d	
Mild	46	30.5	19.75	92	31.3	20.84	0.579
Moderate	47	38.5	20.33	98	37.6	19.35	0.679
Severe	50	40.9	31.77	96	34.2	25.58	0.064

Analgesics: All doctors interviewed prescribe analgesics for pain crises. What differs however is the choice of analgesic at a point in time. 128 of 173 doctors prescribe more than one analgesic to a patient in pain crisis. Of these, 48 prescribed a simple analgesic and a NSAID for mild pain, 50 prescribed NSAID and a simple analgesic, a weak or a strong opioid for moderate pain and 30 prescribe a strong opioid in combination with either a NSAID or a weak opioid for severe pain. For the purpose of analysis, only the first of the drugs prescribed for each category of pain was considered.

Mild Pain: 122 of 173 (70.5%) doctors prescribe simple analgesics, acetaminophen (Paracetamol), or dipyrrone (Novalgin) for mild pain. This comprised 44 of 65 who were within 5 years post qualification and 68 of 108 who were more than 5 years qualified. The number of doctors who prescribe simple analgesics for mild pain crises was statistically significantly higher than those who prescribe other forms of analgesics ($p < 0.00001$). Only 2 of 173 (1.2%) prescribe narcotic analgesics (Figure 3). There was no statistically significant difference between the prescription pattern of doctors ≤ 5 years and those > 5 years. ($p = 0.296$).

Figure 3: Choice of Analgesics in Mild Pain Crises



Moderate Pain: 167 doctors responded to the choice of analgesic in moderate pain crises. 117 (70%) will prescribe either Tramadol (57) or a Non-Steroidal Anti-inflammatory Drug (NSAID) (60). 39 (23.4%) and 11 (6.6%) prescribed simple and opioid analgesics respectively (Figure 4). The number of doctors who prescribe NSAIDs or Tramadol for moderate pain crises was statistically significantly higher than those who prescribe other forms of analgesics ($p < 0.00001$). There was no statistically significant difference between the prescription pattern of doctors ≤ 5 years and those > 5 years. ($p = 0.719$).

Severe Pain: 163 doctors indicated their choices of analgesics in severe pain crises. 131 (80.4%) prescribe opioid analgesics and only 1 (0.6%) prescribes a simple analgesic (Figure 5). The number of doctors who prescribe opioid analgesics for severe pain crises was statistically significantly higher than those who prescribe other forms of analgesics ($p < 0.00001$). There was no statistically significant difference between the prescription pattern of doctors ≤ 5 years and those > 5 years. ($p = 0.357$).

Figure 4: Choice of Analgesic in Moderate Pain Crises

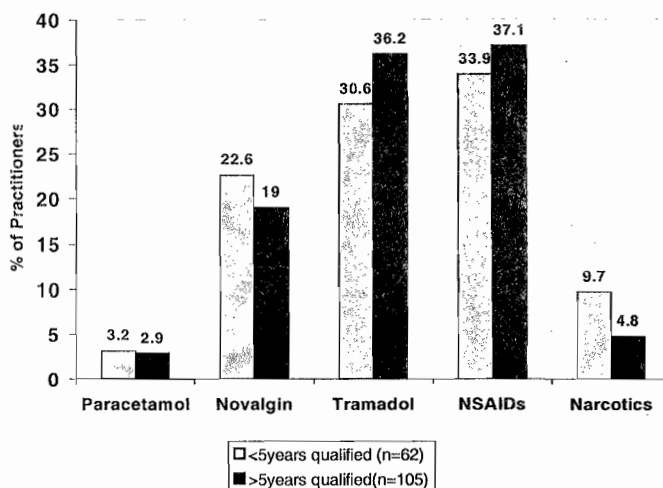
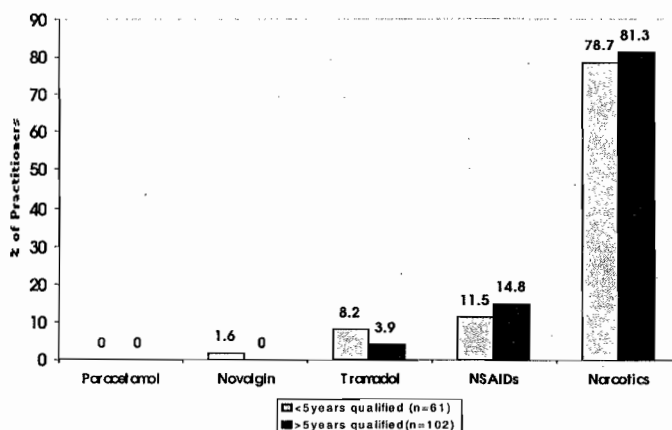


Figure 5: Choice of Analgesic in Severe Pain Crises



Reasons for non-use of opioid analgesics: 32 doctors would not prescribe opioid analgesics even in severe pain crises, for various reasons. 5 (15.6%) for reason of cost, 9 (28.1%) for non-availability and 18 (56.3%) for fear of addiction (Figure 6). 12 (37.5%) are within 5 years post qualification while 20 (62.5%) are more than 5 years.

4 of the 5 doctors who would not prescribe opioids for reason of cost are GPs. The fifth, who is 19 years qualified, is a senior registrar in Haematology. Similarly, 4 of the 5 are more than 5 years in practice.

All the 9 doctors who would not prescribe opioids for reason of non-availability are GPs. 3 (33.3%) are within 5 years qualified while 6 (66.7%) are more than 5 years.

Of the 18 doctors who would not prescribe opioid analgesics for reason of addiction, 7 (38.9%) are within 5 years qualified while 11 (61.1%) are more than 5 years. 15 (83.3%) are GPs who are between 4 and 22 years post-qualification. 2 (11.1%) are Senior Registrars in Medicine and are 9 and 19 years in practice respectively. 1 (5.6%) is a Registrar in Haematology and is 6 years post-qualification.

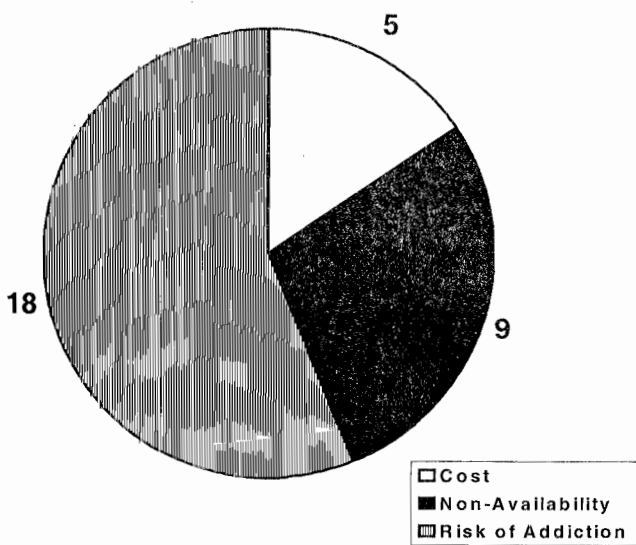
There was no statistically significant difference between the reasons given by doctors ≤ 5 years and those > 5 years.

($p=0.653$).

Volume of Fluid: All the doctors considered fluid replacement to be important. 157 doctors indicated the daily fluid recommendation in pain crises. 38(24.2%) would give less than 2.5 litres. 93(59.2%) give between 2.5 to 3.0 litres while 26 (16.6%) give 3.5 to 4litres. The number of doctors who give 2.5 or more litres of fluid in pain crises was statistically significantly higher than those who give less than 2.5litres ($p < 0.00001$). There was no statistically significant difference between the volume of fluid given by doctors ≤ 5 years and those > 5 years ($p=0.09$).

Type of Fluid: 125 doctors indicated their choice of fluid in the management of pain crises as hypertonic-17 (13.6%), isotonic-106 (84.4%) and hypotonic-2 (1.6%). ($p=0.684$)

Figure 6: Reason for Non-Use of Narcotic Analgesics (in Severe Pain crisis) by 32 Doctors



Use of Antimalarials:

Routine: 45 of 90 doctors (50%) would prescribe antimalarials routinely for all patients in bone pain crises. Others would prescribe antimalarials only if the patient is febrile.

Combined anaemia and pain crises: 56 of 90 (62.3%) would prescribe antimalarials if there is a combined anaemia and bone pain crisis.

None of the doctors interviewed would insist on a laboratory demonstration of malaria parasitaemia before giving antimalarials.

Use of antibiotics:

Routine: 26 of 126(20.6%) doctors will prescribe antibiotics routinely in pain crises. 9 of these are within 5 years and 17 are more than 5 years post-qualification. 100 (79.4%) will not prescribe antibiotics routinely, 57 of these are more than 5 years qualified. There was no statistically significant difference between routine antibiotic prescription by doctors ≤ 5 years and those > 5 years ($p=0.339$).

Mild elevations of White Blood Cell Count: 53 of 123 doctors prescribe antibiotics when the WBC is only mildly elevated. 23 (18.7%) of them are within 5 years of qualification ($p=0.827$).

Marked elevation of WBC: 106 of 124 (85.5%) doctors will prescribe antibiotics when WBC is markedly elevated. These comprised 45 of 53(84.9%) doctors who are within 5 years of qualification and 61 of 71(85.9%) who are more than 5 years qualified. There was no statistically significant difference between antibiotic prescription by doctors ≤ 5 years and those > 5 years ($p=0.875$).

Combined Pain and Anaemia crises: 36 of 117(30.8%) doctors would prescribe antibiotics in combined pain and anaemia crises. These comprised 12 of 50(24%) doctors who are within 5 years of qualification and 24 of 67(35.8%) who are more than 5 years qualified. There was no statistically significant difference between antibiotic prescription by doctors ≤ 5 years and those > 5 years for combined pain and anaemia crises ($p=0.171$).

DISCUSSION

Pain, the bane of SCD is often associated with intense anxiety and in severe cases a feeling of impending doom. It is therefore a medical emergency that should be relieved promptly^{8,9}.

Essential in the management of pain crisis are identification and elimination of precipitating factor(s) where known, appropriate analgesics in the setting of pain, adequate hydration and addition of antimalarials or antibiotics where infection is suspected or identified^{8,9,10}. The experience of the attending physician is also an important recognized factor that influences the outcome of pain crisis. One problem that often faces the physician is the quantification of pain. Although, there are supposedly objective ways of quantifying pain crises.^{11,12,13,14} the only evidence of pain by the bedside is the patients' description of the pain. It is recommended that the physician believes the patient's report, decides whether the pain is mild, moderate or severe and also aggressively treats the pain. Previous workers have observed that treatment of acute pain episodes is highly empiric and highly variable and in fact, some elements of care differ from those suggested by scientific literature^{8,9}.

In this study, most ($>70\%$) of the doctors interviewed would prescribe appropriate analgesics, according to the World Health Organisation guideline for management of various grades of pain.¹⁵ The treatment of mild pains with simple or non-opioid analgesics, and moderate pains with NSAIDs or weak opioids and severe pains with strong opioids are in keeping with the suggested lines of management in literature^{8,9,10,15,16,17}. The use of combination of analgesics is also a state of the art practice. For example the addition of a NSAID, to an opioid analgesic in severe pains is known to reduce the duration and overall amount of opioids used^{8,9,10,15,16,17}.

A large number (29.7%) of the doctors interviewed prescribe drugs that would largely be considered as strong analgesics (NSAIDs and Tramadol, a weak opioid) including 2 (both are within 5 years qualified) who would even give strong opioids for mild pains. On the other hand, opioids are the drugs of choice in severe pains that are non-responsive to other forms of analgesics^{9,15,16,17}. Infact, pethidine (meperidine) or morphine is the most common initial analgesic for severe SCD pain crises in a survey of 549 doctors in the University of Michigan⁸. Opioid analgesics are best given as continuous intravenous infusion, Patient Controlled Analgesia (PCA) or on a fixed-schedule basis^{10,18}. Respi-

ratory depression being most common with continuous infusion, and in the absence of facilities for PCA, the fixed-schedule dosing is the option of treatment in Nigeria. It is advisable to add a NSAID as well, in order to reduce the total amount of opioids used.

In this present study, 80% of the practitioners would prescribe opioids for severe pain crises. Only one who is 2 years post qualification will prescribe a simple analgesic in severe pain crises.

4 out of 5 doctors who would not use opioids for reason of the cost, not surprisingly, are General Practitioners who, usually, are mindful of the total cost of treatment of a patient. It must be emphasised that the opioid analgesics are cost effective when available in the hospital pharmacy. However when they are not, the drugs have to be procured from fellow private hospitals or pharmacies at an exorbitant price. At present, Pentazocine is the only opioid analgesic available in Nigeria, following the embargo on the importation of other opioids¹⁹. Therefore the non-availability and cost are inter-related. It goes to say that if the opioid agents are made available in the health care centres, these 14 doctors will prescribe opioid analgesics in severe pain crises.

It is clear that the decision not to prescribe opioids for fear of addiction is unrelated to years of experience as 11 of the 18 (61.1%) doctors are more than 5 years qualified. It probably confirms that the innate fear of addiction has not been relieved by the experience of the practicing doctors. It may also be unrelated to the field of specialisation as 2 of the doctors are Specialist Physicians and 1 is a Haematologist. It must be admitted however, that the number of these specialists in this study are few and precludes any conclusion.

Some medical practitioners hold back opioid use, partly to protect the society or the patient from street addiction. However, studies have shown that justified use of narcotic analgesics is very rarely associated with addiction.^{20,21}

Justified opioids use is the use of opioid when other remedies are not effective and discontinuation of the opioid when the opioid-sensitive pain resolves^{16, 21}. In other words, opioids are indicated for short-term management of severe pains in SCD. Long-term use of opioid for chronic pain can be associated with tolerance and physical dependence but these should not be confused with psychological dependence (addiction) in which opioid is used in the absence of pain¹⁶.

From the above, while most (>70%) doctors would treat sickle cell pain crises appropriately with respect to choice of analgesics, a large number though would still choose inappropriate agents.

Although, all the doctors agree that fluid replacement is important, and majority would give isotonic fluid. In uncomplicated bone pain crisis, 4.3% Dextrose in 0.18 Normal Saline or 5% Dextrose in water both of which are hypotonic should alternate with 5% Dextrose in saline.^{10,22} The hypotonic fluids are presumed to improve intracellular hydration of sickle erythrocytes and thereby reduce the tendency to sickling. However, to the best of the knowledge of the authors, there have been no controlled studies comparing the influence of tonicity of fluid to pain relief in Sickle cell pain crisis.

As many as a quarter of the doctors would give less than

the daily recommended average of 70 milliliters per kilogram body weight of fluid to adult patients in pain crises.²²

While the use of routine antibiotics in sickle pain crises may be uncalled for, the use in overt bacterial infection, moderate or markedly elevated WBC count is appropriate. This is particularly so if there is an increase, a left shift or toxic granulations in the neutrophils.¹⁰ Delay in initiating antibiotics usually results from the erroneous diagnosis of malaria in all febrile patients, as well as regarding a high corrected WBC count as being a normal feature of SCD. On the other hand, the addition of routine antimalarials in all cases of pain crises is considered practical and justified by the authors considering the prevalence of malaria in the environment, the irregularity of anti-malarial prophylaxis amongst patients⁷ and the increasing prevalence of malaria in past studies.^{7,23} In addition, many health care services do not have facilities for emergency investigation for malaria parasitaemia. In order that the diagnosis of malaria would not mask a bacterial infection, all clinicians are advised to search for occult bacterial infection by thorough physical examination as well as laboratory investigations including a total and differential white blood cell count. A considerable number of doctors interviewed in this study would not give antibiotics even with marked elevation of WBC.

It was observed in a past study that all cases of combined pain and anaemia crises had an underlying infection that was either malaria or bacterial infection⁷. One must therefore search for these infections in a patient with combined crises.

In conclusion, it is commendable that majority of the doctors interviewed manage sickle pain crisis appropriately, there are still diversity in the choice of analgesics in the setting of various grades of pain crises, volume of fluid replacement as well as when to use antimalarials and antibiotics. Considering the number of patients with SCD in Nigeria, many of whom will experience pain crises at some point, one would desire that all practitioners should manage these acute episodes appropriately. This brings about a suggestion of Practice Guidelines or protocols as used in some centers.⁸ The American Family Physician has recently introduced a guideline for the management of pain crises in SCD¹⁵. The need for a guideline in the management of a common problem might be arguable, the provision of one unifies treatment and also serves as a reference point for assessment of scientific intervention.

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