Full blood count and reticulocyte count in painful sickle crisis

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Abstract

A short cut review was carried out to establish whether routine haematological testing is useful in patients with painful sickle crisis. 21 papers were found using the reported searches, of which three presented the best evidence to answer the clinical question. The author, date, and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. It is concluded that routine haematological testing does not alter management decisions in these patients.

Three part question

In a [patient with painful sickle crisis] does a [complete blood count or reticulocyte cell count] alter [management decisions]?

Clinical scenario

A 25 year old man with sickle cell disease presents with a two day history of pain in his arms and legs. His pain is consistent with his usual painful crisis symptoms. He is afebrile, has normal vital signs, and has no acute findings on physical exam. You promptly treat his pain. You order haematologic tests in these situations as a matter of routine. You wonder if the results of his complete blood count or reticulocyte count will alter your management.

Search strategy

Ovid MEDLINE 1966 to January Week 3 2006

EMBASE 1980 to 2006 Week 04

[exp anaemia, sickle cell/OR sickle adj cell.mp.] AND [exp emergency service, hospital/OR emergency department.mp. OR exp emergencies/] AND [exp Reticulocyte count/OR exp Blood cell count/] Limit to Humans and English language.

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[Anemia, Sickle Cell (MeSH explode all trees)] AND [Blood cell count (MeSH explode all trees) OR Reticulocyte Count (MeSH explode all trees)].

Search outcome

The search yielded 21 articles. Bibliographic references found in these articles were also examined to identify pertinent literature. Only original research articles were included. Three articles directly addressed the question.

Comment(s)

Haematological testing in the evaluation of sickle cell patients presenting with painful crisis frequently includes a complete blood count and reticulocyte cell count. Furthermore, this testing is often ordered on a routine basis, defined here as not specifically indicated by patient history or physical examination alone. This routine testing is performed with the thought that it will detect occult illness, such as aplastic anemia or infection, and alter patient management.

The literature reviewed here excluded patients presenting with ill appearance, fever, or abnormal vital signs because haematologic testing in such situations is more standardised. The studies reviewed do not support the practice of routine haematologic testing in sickle cell patients presenting with painful crisis. With the exception of part two of the study by Lopez *et al*, which had significant bias involved, the complete blood count and reticulocyte cell count did not alter management decisions made by physicians.

The literature also found no value in the ability of these tests to detect occult illness. Notably though, the studies reviewed have a paucity of patients with complications such

Table 3

Author, date, and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Lopez BL, <i>et al</i> , 1996, USA	117 patients with 323 presentations in a two part study. First part 53 patients with 119 presentations, second part 64 patients with 204 presentations	Part one: Retrospective chart review Part two: Prospective study	Haematologic differences between admitted and discharged patients	None on retrospective review Higher mean white blood cell counts but no difference in the presence of significant infections during the prospective study.	Small size Institutional bias in regards to admission decisions and white blood cell count.
Wells BL, <i>et al</i> , 2002, USA	All study patients had a complete blood count and reticulocyte count done. 34 adult patients with 101 presentations. All patients had a complete blood count and a reticulocyte count done. The physician was initially blinded to the results of the reticulocyte count.	Prospective study	Management Suspicion of aplastic anaemia	No management was changed based on reticulocyte count data. No patients were suspected to have aplastic anaemia before or after reticulocyte cell count was available.	No cases of aplastic anaemia. Small Size No cases of aplastic anaemia.
Chapman JJ, <i>et al</i> , 2004, USA	30 children with 86 presentations. A complicated presentation was defined as one that required admission, antibiotics, blood products, or resulted in acute chest syndrome within forty-eight hours.	Retrospective study	Haematologic differences between complicated and uncomplicated patients	None	Retrospective Small size

as significant occult infection or occult aplastic crisis. The lack of events may represent appropriate patient selection in that patients with these complications often present with abnormal vital signs or illness specific symptoms. It is possible the exclusion criteria described above removed patients with these complications from the study population. Alternatively, sample sizes may have been too small to capture these rare events.

► CLINICAL BOTTOM LINE

The routine use of complete blood count and reticulocyte count in sickle cell patients presenting with painful

crisis does not alter management decisions. Selective use of these tests can be based on patient age, reported symptoms, vital signs, physical examination, and clinical judgment.

Lopez BL, Griswold SK, Navek A, *et al*. The complete blood count and reticulocyte count – are they necessary in the evaluation of acute vasoocclusive sickle-cell crisis? *Academic Emergency Medicine* 1996;**3**:751–757.

Wells BL, Vizioli TL, Counselman FL. The reticulocyte count: Is it needed for evaluating typical sickle cell crisis presenting to the ED? *American Journal of Emergency Medicine* 2002;**20**:69–70.

Chapman JI, El-Shammaa EN, Bonsu BK. The utility of screening laboratory studies in pediatric patients with sickle cell pain episodes. *Am J Emerg Med* 2004;**22**:258–263.