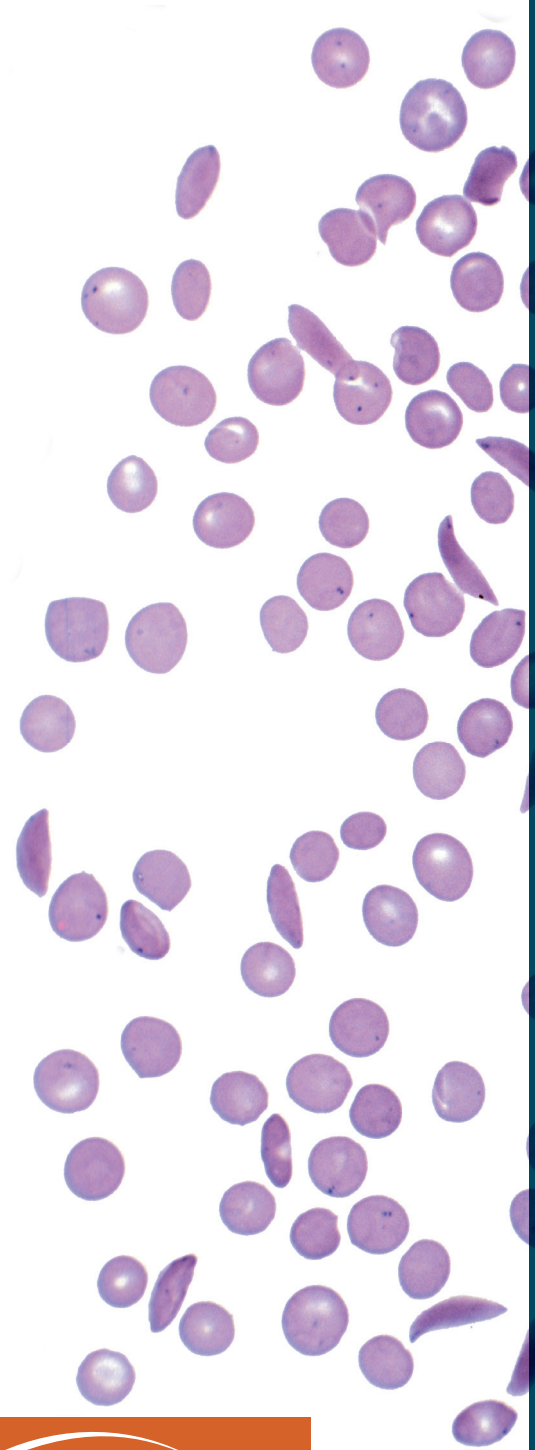

A Sickle Crisis?

A report of the National Confidential Enquiry into Patient Outcome and Death (2008)

NCEPOD

Foreword

For the National Confidential Enquiry into Patient Outcome and Death this report on sickle cell disease and thalassaemia is one of a new wave of studies. NCEPOD started life investigating the circumstances of perioperative death but broadened its remit to look at the care of non-surgical patients and to address outcomes other than death. Previous studies have usually been defined by a particular clinical setting and a process of care such as out-of-hours surgery, emergency admissions or care of the severely injured, and it was this setting which defined the patient group. In the study we focus on a group of patients who have a specific diagnosis which is with them throughout life. For these patients there is a lifetime of episodic illness.

The haemoglobinopathies are the most prevalent inherited diseases of mankind, constituting a major health problem in many countries. At the level of the beta globin chain in the all-important haemoglobin molecule, the impact of the single point mutation (in sickle patients) or abnormal developmental switching (in beta thalassaemia) is huge. Until recently, life expectancy was short. But greater scientific understanding, better drug therapy, and the implementation of more standardised protocols mean that people with sickle and thalassaemia survive well into adult life.

The demography is shifting, particularly for sickle cell disease. Because of immigration from Africa and the Caribbean, there are more sickle cell adults and children arriving in the United Kingdom, and more mothers delivering affected babies. England now has complete neonatal screening for haemoglobinopathy; Wales and Scotland are rolling it out, and we discover that the frequency of the disease is now at least as common as the more familiar cystic fibrosis. Whilst an increasing proportion of affected people will be known from birth, the undiagnosed will continue to present, ill, at health centres. And from being mainly the preserve of London and the West Midlands, sickle patients increasingly present anywhere in the UK.

Managing the haemoglobinopathies is a complex multi-disciplinary process because of the key role of haemoglobin and red blood cells in all bodily functions. It has been apparent for some time that the quality of medical experience around haemoglobinopathy is patchy and not universal. This applies to initial diagnosis, crisis management, pain relief and the many other complications that are referred to in this report.

So for all these reasons, NCEPOD was pleased to undertake a review of current haemoglobinopathy mortality, to obtain broad baseline data and make recommendations to alter practice. In this way, we hope to contribute to improving the quality of life of patients – whose numbers and attendances at health care centres are inevitably going to increase.

Sebastian Lucas
NCEPOD Clinical Co-ordinator

Tom Treasure
NCEPOD Chairman

Principal Recommendations

- In our multi-racial society, it is essential that all doctors should have a basic understanding of the implications of thalassaemia and sickle cell trait. (General Medical Council)
- As a minimum, the Department of Health guidance regarding vaccination and prophylactic antibiotics should be followed in order to prevent sepsis from hyposplenism. (Primary Care Trusts)
- A multidisciplinary and multi-agency approach is needed in the ongoing pain management of patients with sickle cell disease – essentially this takes place outside hospitals for the majority of patients. (Primary and Secondary Care Trusts)
- Regular assessment of acute pain, sedation and respiratory rate should be undertaken and recorded for all patients admitted with sickle cell disease. The frequency of these observations should reflect the degree of pain and dose of opioids administered, to allow recognition of opioid overdose. The development of “track & trigger” systems would greatly enhance better pain control and patient safety. (Clinical Directors)
- All staff should be aware that people with sickle cell disease are subject to the diseases that other patients suffer from as well. If there is uncertainty as to whether the problem is sickle cell related, advice should be sought from an experienced clinician. (Clinical Directors)
- All sickle cell disease patients should have a carefully maintained fluid balance chart for the duration of their admission. (Nurses)
- Patients with sickle cell disease or beta thalassaemia major should be managed by, or have access to, clinicians with experience of haemoglobinopathy management. (Primary and Secondary Care Trusts)
- Healthcare centres responsible for the management of patients with haemoglobinopathies should have access to protocols/guidelines from their regional specialist centre. (Primary and Secondary Care Trusts)
- Cause of death in sickle cell disease patients must be better evaluated, whether by clinicians reviewing the records and writing a death certificate or by pathologists performing an autopsy. Clinico-pathological correlation is critical in this complex disease. (Clinicians and Pathologists)
- A national database of patients with haemoglobinopathies should be developed and maintained, to include standardised information on death, for regular audit purposes. (Department of Health)

Summary and comment

This review of deaths from haemoglobinopathy over two years was proposed to provide insights into remediable factors that can improve the care of these patients and to indicate the current clinico-pathological scenarios that result in death. The documentary information (on clinical and pathological matters) was not complete for all the cases that were reported and therefore the study size is small. Nonetheless, a notable finding was the high proportion of cases (nearly half) where, using this method of clinical review, the actual cause of death was debatable or unknown. If this small series is representative, it amounts to a wake-up call to the haemoglobinopathy clinical community: less is known about the severe complications of sickle cell disease that lead to death in individual patients than was previously thought. It prompts the conclusion that a national database of haemoglobinopathy patients is needed and a rigorous systematic audit of their deaths that incorporates as much objective information (including focussed specialist autopsies) as possible. Only by this means will haemoglobinopathy mortality be better understood and more knowledge available on how to reduce it.

Monitoring patients

As in previous studies, NCEPOD has highlighted examples where patients who were acutely ill were not offered support from sufficiently experienced medical staff. NCEPOD firmly believe that there is a need to monitor patients on opioids more carefully. Nurses and doctors both need to be more familiar with what needs to be done if patients' vital signs, including the respiratory rate, become abnormal. These simple measures might well have avoided some of these deaths.

Clinical networks

There is a move towards establishing clinical networks. While these will offer some benefit, there will still be a problem for people with sickle cell disease who present to remote units lacking experience in managing the complications of this condition. It is important that all haematologists who have a responsibility for managing people with sickle cell disease or thalassaemia have access to appropriately qualified colleagues who can offer support, where required. It may not be possible to easily transfer an acutely sick individual, especially if they are already experiencing considerable pain.

There is a need for holistic care for people with haemoglobinopathies. Most will need long term medications with all of the difficulties that this can bring in terms of compliance. Specialist centres, with support from nurses, psychologists and other healthcare professionals are necessary to ensure optimum care and compliance.

It is essential that centres offering support for acutely ill patients with haemoglobinopathies should have consultants with appropriate experience available at all times and that these consultants ensure that local guidelines and national standards, when developed, are adhered to. This will need auditing.

Development of national guidelines

As part of the study, NCEPOD was supplied with many local guidelines. It is also understood that there is now a nationally accepted management protocol for people with thalassaemia but that the equivalent overarching document for people with sickle cell disease is still in preparation. NCEPOD believes that the Sickle Cell Society has sponsored the preparation of an appropriate national guideline; it is hoped that this guideline will be produced in the near future and that it will be implemented and audited appropriately.

Given the clinical problems that arise in people with sickle cell disease, it is hoped that national guidelines will become available for:

- The management of acute chest syndrome
- The appropriate management of acute infections
- The acutely deteriorating sickle cell patient
- Deteriorating renal function
- The use of opioid drugs, and how to avoid dependency and to manage it.

National database of haemoglobinopathy patients

Within the body of the report a number of references have been made to the fact that there is no national database of those affected by sickle cell disease; it is understood that there is a thalassaemia database but that there have been problems in maintaining it. There is now a policy to implement a national database for haemoglobinopathies and NCEPOD would strongly support this.

Such a database will bring benefit to the patients because it will make it possible to understand more about the problems that arise within the affected communities. For example, during the study it was discovered that two of the deaths in people with sickle cell anaemia appeared to be due to coexistent systemic lupus erythematosus. One of the team undertaking this study believed that this problem may be more prevalent in the sickle cell community than expected. However, because there is no database, it is impossible to know the exact denominator and one cannot, therefore, be certain as to whether this observation is an artefact or a genuine and potentially important difference which requires further research. A database would also allow better comparison with the outcomes achieved within the setting of the NHS and with patients in other major centres, such as those in Jamaica or the United States of America.

Such information may in turn lead to improvements in the care of people affected by sickle cell disease in particular. Differences in management strategies, such as the use of non-steroidal anti-inflammatory drugs instead of opioid analgesics may, over time, have a significant impact on, for example, the incidence of renal failure within the community. In the absence of a national database it will be difficult to prove such possibilities, to the disadvantage of all concerned.

Pain control

This study has demonstrated that pain and its management presents a major problem for patients with sickle cell disease. The episodic nature of the disease is notable in the requirements for opioid analgesics potentially in high doses. The complexity of this pain poses significant challenges for those who have sickle cell disease, as well as the healthcare professionals who care for them. In this study there were examples of poor multidisciplinary team working in both ongoing pain and acute pain management.

For the tiny minority of patients who develop drug dependency there is a need to ensure that appropriate services are made available in order to help them deal with this problem.

A recurring theme from this study was the excessive doses of opioid analgesics in patients with painful crises. There appeared to be a lack of understanding of the adverse effects of these drugs by doctors and nurses. In addition, assessment of pain, sedation and respiratory rate was infrequently performed.

For the situation to be improved there needs to be better education and training in pain control management for healthcare professions who care for patients with sickle cell disease. Experts in acute and chronic pain control should be major contributors in the care of these patients. Trusts need to develop local written protocols for the management of painful episodes based on national guidelines and local facilities. These should include regular clinical review to determine the efficacy of the pain therapy and avoid overdose. The use of "track & trigger" systems would greatly enhance better pain control and patient safety. Furthermore, patients need to be encouraged to be active participants in the management of their pain. This will require enhanced patient education to improve understanding so that they can accept greater responsibility for their pain control. There is a case for doing more clinical research into pain management techniques for this group of patients.

Autopsy evaluation and causes of death

The quality of autopsies was poor; this problem has been investigated previously [1]. In nine of the 13 adult cases with an autopsy report to review, the advisors either disagreed with the interpretation, or found the autopsy unintepretable. It is essential that autopsies should be properly conducted, by experienced pathologists availing themselves of full investigations, so that an understanding of the problems leading to death can be properly delineated.

Some problems, such as acute chest syndrome, are complex and may be due to a range of underlying problems. Histological examination is important; care should be taken in interpreting findings since post mortem sickling may otherwise be misinterpreted as having contributed to death. The evaluation of the chronic lung pathologies associated with sickle cell disease is even more complicated. Properly conducted autopsies may still have a lot to contribute to a better understanding of issues such as stroke and lung disease.

Recommendation

- A national database of patients with haemoglobinopathies should be developed and maintained, to include standardised information on death, for regular audit purposes. (Department of Health)

Reference

1. The Coroner's Autopsy: Do we deserve better? National Confidential Enquiry into Patient Outcome and Death. 2006 *www.ncepod.org.uk*

Key findings and recommendations

Overview Data

Key Finding

- A disproportionately large number of cases with thalassaemia and sickle cell disease trait were reported to NCEPOD when the trait was not relevant.

Recommendations

- In our multi-racial society, it is essential that all doctors should have a basic understanding of the implications of thalassaemia and sickle cell trait. (General Medical Council)
- Sickle cell trait and thalassaemia trait should rarely be included on the death certificate; and if included this should only be after review by an individual who has experience in haemoglobinopathies. (Pathologists)

Ongoing Care

Recommendations

- As a minimum, the Department of Health guidance regarding vaccination and prophylactic antibiotics should be followed in order to prevent sepsis from hyposplenism. (Primary Care Trusts)
- All children with sickle cell disease should receive pneumococcal vaccination according to national guidance and regular penicillin prophylaxis from the age of three months. Regular review in a specialist centre is advised. (Primary Care Trusts)
- Patients should be encouraged to understand the importance of regular review to optimise the management of their condition. (Primary and Secondary Care Trusts)
- There needs to be clear recording of vaccination status to prevent omission by default; liaison between primary and secondary care is needed. (Primary and Secondary Care Trusts)

Pain Management

Key Findings

- Of the 40 sickle cell disease patients for whom a questionnaire was received, 14 took regular pain medications for ongoing pain management. All of these took a combination of opioids and simple analgesics. In only one patient was there was evidence of medication being dispensed from multiple sources.
- In the opinion of the advisors, in six patients there was evidence of dependency issues. However, in 13 patients there was insufficient information from the casenotes to form an opinion.
- In general, there was a lack of a multidisciplinary or multi-agency approach to the management of opioid dependency in these sickle cell disease patients.
- Of the 35 sickle cell disease patients who died in hospital, 19 had pain as an admitting complaint. In nine of these patients, it was the advisors' opinion that excessive doses of opioids had been given and of these there were five patients where complications occurred due to overdose which contributed to the ultimate death of these patients.
- In two thirds of the patients admitted with acute pain there was lack of evidence that pain or the adverse effects of opioids were formally assessed on a regular basis. Furthermore, of those patients who did have pain or adverse effects monitored the frequency of observations was inadequate.
- In seven of the patients who received excessive doses of opioids there was lack of knowledge regarding acute pain management and inadequate clinical review of the escalating analgesic requirements. It was of particular note that in all of these cases, junior trainee medical staff were responsible for the prescribing of analgesia and no attempt was made to seek expert advice either from consultants in haemoglobinopathies or acute pain management.

Recommendations

- Healthcare professionals should work in partnership with patients with sickle cell disease to develop individualised pain management strategies which should include patient education. (Primary and Secondary Care Trusts)
- A multidisciplinary and multi-agency approach is needed in the ongoing pain management of patients with sickle cell disease – essentially this takes place outside hospitals for the majority of patients. (Primary and Secondary Care Trusts)
- Those patients with sickle cell disease and drug dependency need special attention because of the episodic nature of the pain and the consequent requirement for opioids which can exacerbate their dependency problems. (Primary and Secondary Care Trusts)
- Regular assessment of acute pain, sedation and respiratory rate should be undertaken and recorded for all patients admitted with sickle cell disease. The frequency of these observations should reflect the degree of pain and dose of opioids administered, to allow recognition of opioid overdose. The development of "track & trigger" systems would greatly enhance better pain control and patient safety. (Clinical Directors)
- Expert assistance from senior doctors with experience in the management of sickle cell pain should be sought at an early stage for patients whose pain is not controlled using standard methods. (Clinical Directors)
- Training for medical and nursing staff that care for patients with sickle cell disease in the management of both ongoing and acute pain needs to improve. This should include in-service training and specific tailor made courses for sickle cell pain management with regular updates. (Primary and Secondary Care Trusts)

Final clinical management

Key Finding

- There were fewer surgical cases submitted than were anticipated. NCEPOD is also aware of the on-going study of pre-operative blood transfusion [10].
- Basic nursing observations, appropriately interpreted, are of critical importance to the management of people with sickle cell disease and were not always adhered to.
- Fluid balance was not well recorded in some patients and this contributed to deterioration in several patients clinical condition.
- There were examples of failure to take action by both medical and nursing staff in the face of the deteriorating clinical condition of severely ill patients.

Recommendation

- Acute chest syndrome is a major cause of morbidity and mortality in patients with sickle cell disease. Management of patients with this complication should be according to local protocols and early advice from specialists is essential. (Primary and Secondary Care Trusts)
- Chronic sickle chest disease is an expanding, complicated area and requires more careful correlation of pre-mortem clinical, physiological and imaging data with autopsy pathology. (Clinicians and Pathologists)
- New national standards for the management of sickle cell disease are soon to be issued and it is to be hoped that these will include regular review of renal function. (Department of Health)
- In all haemoglobinopathy patients who are acutely ill there should be a check to ensure that the kidneys are functioning properly. Acute illnesses may bring to light other problems such as renal tubular acidosis and all physicians caring for this group of patients must be aware of this. (Clinical Directors)
- All staff should be aware that people with sickle cell disease are subject to the diseases that other patients suffer from as well. If there is uncertainty as to whether the problem is sickle cell related, advice should be sought from an experienced clinician. (Primary and Secondary Care Trusts)
- Patients with sickle cell disease are often very skilled in knowing exactly how their crises develop and if they say that this problem ‘”is different” then the clinician should pay heed and seek further advice if appropriate. (Primary and Secondary Care Trusts)
- Guidelines and education about vaccination and antibiotic prophylaxis for children should be followed. (Primary Care Trusts)
- Early intervention is essential in children with sickle cell disease who become acutely unwell to reduce morbidity and morality. Expert advice should be sought. (Primary and Secondary Care Trusts)
- All sickle cell disease patients should have a carefully maintained fluid balance chart for the duration of their admission. (Nurses)
- There is a need to ensure that any deterioration in vital signs is acted upon promptly. NCEPOD would urge those responsible for the continued development and education of staff to take note of these problems. (Clinical Directors)

Organisation of care

Recommendations

- Patients with sickle cell disease or beta thalassaemia major should be managed by, or have access to, clinicians with experience of haemoglobinopathy management. (Primary and Secondary Care Trusts)
- All patients with sickle cell disease or beta thalassaemia major should be reviewed at least annually at a specialist centre. (Primary Care Trusts)
- All haemoglobinopathy patients should have a named specialist, ideally a haematologist, responsible for their care. The haematologist must have an appropriate level of expertise to care for the patient or should make links with appropriate experts. (Primary and Secondary Care Trusts)
- Healthcare centres responsible for the management of patients with haemoglobinopathies should have access to protocols/guidelines from their regional specialist centre. (Primary and Secondary Care Trusts)

Death certificate and autopsies

Key Finding

- Deaths in sickle cell disease patients were not well evaluated and depicted.

Recommendations

- Cause of death in sickle cell disease patients must be better evaluated, whether by clinicians reviewing the records and writing a death certificate or by pathologists performing an autopsy. Clinico-pathological correlation is critical in this complex disease. (Clinicians and Pathologists)

Published May 2008
by the National Confidential Enquiry
into Patient Outcome and Death

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ISBN 0-9539240-9-2

A company limited by guarantee Company no. 3019382
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