2.7 Kidney Disease: Treatment of Anaemia in Patients on Haemodialysis

Background

- Anaemia is a condition in which there is a reduction in the level of haemoglobin - the red component of blood which carries oxygen around the body. This is a common problem in patients with renal (kidney) failure.
- Achieving and maintaining a satisfactory haemoglobin level for patients on haemodialysis (a treatment for renal failure) is a marker of good overall health care.
- The *Clinical Standards for Adult Renal Services*, available from NHS Quality Improvement Scotland, give guidance on providing clinical services in hospital settings for people with renal failure.
- These standards include the national target for treating anaemia: For a minimum of 85% of patients, the haemoglobin concentration is no less than 10 grams per decilitre (g/dL) after three months on haemodialysis.
- As part of its quality assurance programme, the Scottish Renal Registry collects data on the haemoglobin levels of patients with renal failure from throughout Scotland.

Key Findings

- In the last five years, there has been an increase of about 15% in the proportion of Scottish patients with a haemoglobin concentration of no less than 10 g/dL.
- In September 2002, 76% of Scottish patients on haemodialysis for three months or more achieved a haemoglobin concentration of no less than 10 g/dL.
- While the variations between the ten renal units in Scotland were small, in this audit cycle only Crosshouse Hospital, Kilmarnock and Raigmore Hospital, Inverness achieved the national target for treatment of anaemia in patients on haemodialysis.

Introduction

Haemoglobin is the red component of blood which carries oxygen to the tissues in the body. In good health the haemoglobin concentration in the blood is about 15 grams per decilitre (g/dL) in men and 14 g/dL in women. Anaemia is a condition in which there is a reduction of haemoglobin in the blood. Even minor degrees of anaemia can result in a reduced quality of life, poor exercise tolerance, impaired heart function, upset sleep patterns, difficulty concentrating, increased susceptibility to infection and reduced libido.

Anaemia is a common problem in renal (kidney) failure. When the kidneys begin to fail, they produce less of the hormone erythropoietin and the body makes less haemoglobin. Anaemia can also occur as a result of reduced intake/use of the food stuffs (haematinics) required by the body to manufacture haemoglobin, interference in the production of blood by waste products which build up, and sometimes because of increased loss of blood. Without treatment, the haemoglobin concentration can fall to as low as 5 g/dL. A satisfactory haemoglobin level can only be achieved if all factors contributing to the anaemia are treated.

Achieving a satisfactory haemoglobin concentration reduces the problems of anaemia and is a marker of good overall health care. When all other aspects of a patient's care have been addressed, epoetin (a form of erythropoietin) can be prescribed as a medicine to increase the blood count. Epoetin is expensive and in the past this sometimes restricted its use, although more recently epoetin has been more widely available.

It is currently unclear exactly what the optimal haemoglobin concentration for patients with renal failure is. Attempts to achieve normal haemoglobin levels in all patients on dialysis may have disadvantages. The current recommendations for Scotland[1], which are outlined below and are essentially the same as those for the rest of the UK, represent a reasonable compromise and provide a standard against which practice can be compared.

1. Clinical Standards Board for Scotland. Clinical Standards for Adult Renal Services. Edinburgh: Clinical Standards Board for Scotland (2002). www.nhshealthquality.org

Data and Methods

The Scottish Renal Registry (SRR) collects and analyses information on haemoglobin concentration in haemodialysis patients from all adult renal units in Scotland.

There are 10 adult and one paediatric renal units in Scotland. They cooperate closely to offer a full range of care and facilities to patients with renal disorders. The 10 adult renal units also provide services at 8 satellite haemodialysis units (further details are available on the SRR website). For audit purposes, the results from these satellite units are included with those from the respective main renal unit. This report concerns adult renal units.

The SRR was established by the Scottish Renal Association (SRA) in 1991. It is a paperless registry which is run in collaboration with the Information and Statistics Division of NHSScotland (ISD) by doctors, nurses, statisticians and administrators who are actively involved in the renal service. The SRR helps to monitor the quality and availability of the service by running a continuously expanding audit and quality assurance programme.

The Scottish renal units have been working to improve the treatment of anaemia in patients using haemodialysis, with the support of the SRA and using evidence from the SRR. The renal units and the SRR have gone to great lengths to ensure full patient registration and the collection of complete and accurate data. In addition to collecting data, senior staff from the renal units have contributed to the definitions required to ensure comparability of data from different units. Training sessions have also been organised for staff, to ensure data are collected accurately and that any action necessary to improve on under performance can be identified and implemented quickly.

The SRR has also collaborated with NHS Quality Improvement Scotland (NHS QIS) in both developing standards for adult renal services[1] and reviewing performance against these standards nationwide[2]. The national target, stated in these standards, is that in a minimum of 85% of haemodialysis patients, a haemoglobin concentration of not less than 10 g/dL should be achieved after three months of dialysis.

2. NHS Quality Improvement Scotland. National Overview for Adult Renal Services. Edinburgh: NHS Quality Improvement Scotland (2003). www.nhshealthquality.org

Results and Discussion

In September 2002, 1209 patients had been on haemodialysis for at least three months and were therefore eligible for the audit. The SRR has valid data on 1166 patients and data are missing from only 4% of patients (eg patients who had a recent blood transfusion).

Figure 1 shows the percentage of patients in each renal unit who had a haemoglobin concentration of not less than 10 g/dL. This allows a comparison with the target for each unit and for Scotland as a whole.

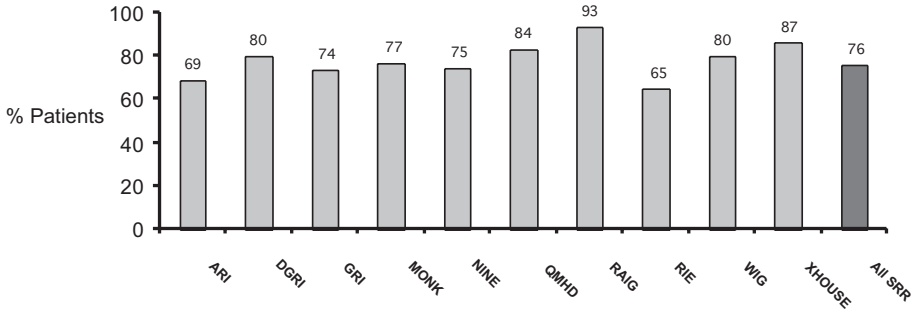
The SRR has also presented the September 2002 data as a set of cumulative frequency curves (Figure 2), with one curve for each renal unit and one for the whole country. While Figure 1 is easier to read at a glance, the cumulative frequency curves provide more detailed information about haemoglobin levels throughout Scotland, namely:

i) the percentage of patients which achieve a given haemoglobin concentration;
ii) the median haemoglobin concentration; and
iii) the distribution pattern, eg the proportion of patients with very low or high results.

As the results from all the renal units are very similar, the curves overlap making it hard to distinguish individual renal units. To improve clarity the data are presented in two graphs, with five renal units per graph.

Figure 3 presents data collected for the last 5 years, depicting the proportion of Scottish patients with a haemoglobin concentration of no less than 10 g/dL.

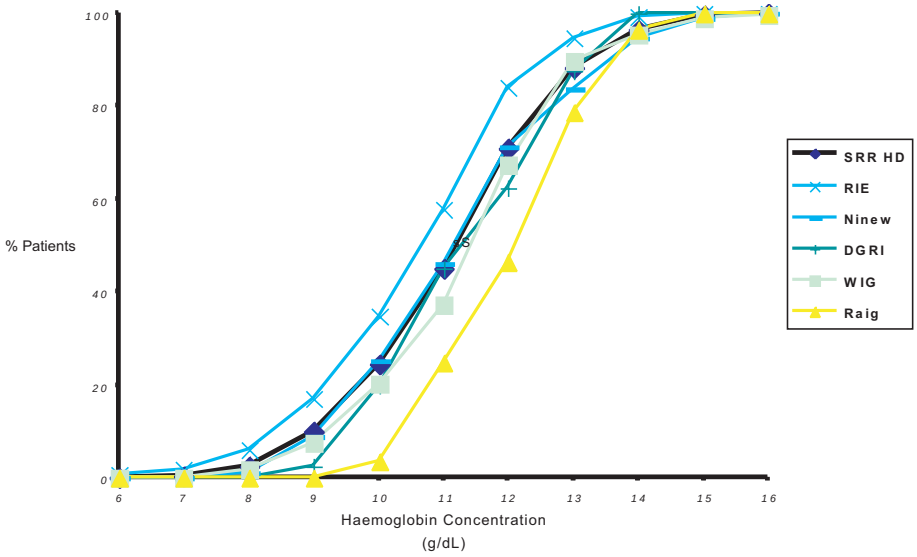
Figure 1. The percentage of patients with a haemoglobin concentration of 10 g/dL or more, for each adult renal unit for September 2002.

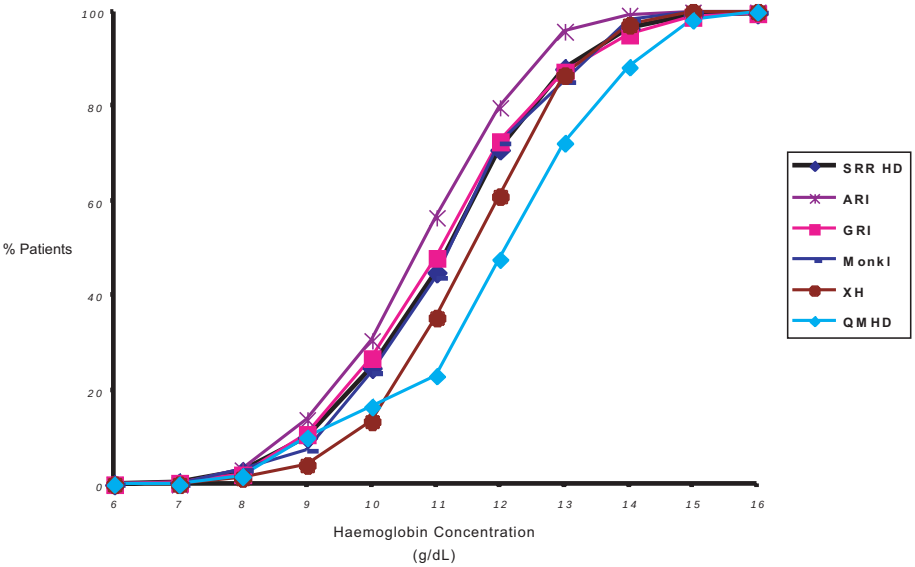


Abbreviations:

Scotland (ALL SRR)
Aberdeen Royal Infirmary (ARI)
Crosshouse Hospital, Kilmarnock (XHOUSE)
Dumfries & Galloway Royal Infirmary (DGRI)
Glasgow Royal Infirmary (GRI)
Monklands Hospital, Airdrie (Monk)
Ninewells Hospital, Dundee (Nine)
Queen Margaret Hospital, Dunfermline (QMHD)
Raigmore Hospital, Inverness (Raig)
Royal Infirmary, Edinburgh (RIE)
Western Infirmary, Glasgow (WIG)

Figure 2. Haemoglobin concentration of patients on dialysis for three months or more, for each adult renal unit for September 2002.

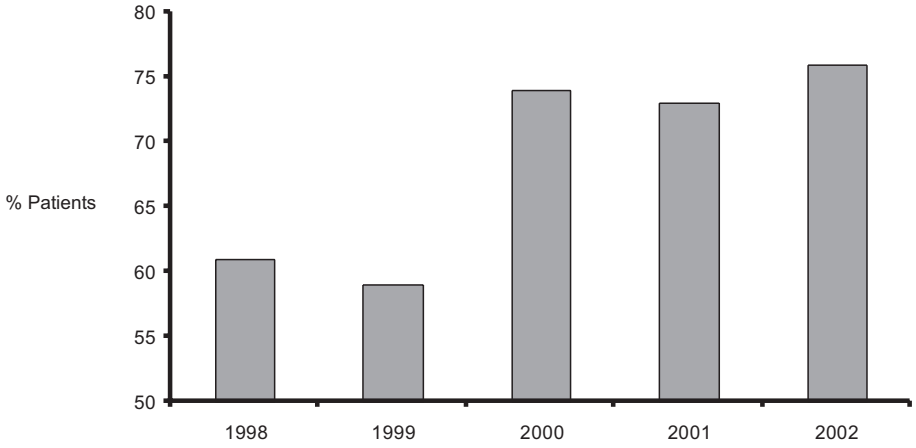




Abbreviations:

Scotland (SRR HD)
Aberdeen Royal Infirmary (ARI)
Crosshouse Hospital, Kilmarnock (XH)
Dumfries & Galloway Royal Infirmary (DGRI)
Glasgow Royal Infirmary (GRI)
Monklands Hospital, Airdrie (Monkl)
Ninewells Hospital, Dundee (Ninew)
Queen Margaret Hospital, Dunfermline (QMHD)
Raigmore Hospital, Inverness (Raig)
Royal Infirmary, Edinburgh (RIE)
Western Infirmary, Glasgow (WIG)

Figure 3. The percentage of patients with a haemoglobin concentration of 10 g/dL or more, for Scotland between 1998 and 2002.



The national target is that a haemoglobin concentration of no less than 10 g/dL should be achieved in a minimum of 85% of patients after three months on haemodialysis[1]. In September 2002, 76% of patients on haemodialysis throughout Scotland achieved a haemoglobin concentration of no less than 10 g/dL (Figure 1).

As can be seen from Figures 1 and 2, there are only small differences between the 10 units in Scotland. Nonetheless, at this time only Raigmore Hospital, Inverness and Crosshouse Hospital, Kilmarnock met the national target for treatment of anaemia in haemodialysis patients.

In recent years there has been a rise, of about 15%, in the proportion of patients with a haemoglobin concentration of no less than 10 g/dL (Figure 3). This is almost certainly due to an overall improvement in the quality of haemodialysis, which the SRR has reported elsewhere, to improved and increased use of haematinics and epoetin as funding has become available, and to an increase in experience and knowledge.

This audit is continuing. The SRR is examining in more detail the use of haematinics (eg iron) and epoetin, and the efficiency of the dialysis treatment itself.

Further information about the Scottish Renal Registry, including other reports, is available on its website: www.show.scot.nhs.uk/srr

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