

A Nurse-Initiated Iron Management Protocol for Patients on Hospital Haemodialysis

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Abstract

Background: The quality assurance coordinator from the Department of Renal Medicine at the St George Hospital conducts a six monthly review of the biochemical and haematological results of patients on hospital haemodialysis. These markers are benchmarked against prior unit results, national Caring for Australians with Renal Impairment (CARI) guidelines and Australian and New Zealand Data Registry (ANZDATA). Ongoing audit results identified that the unit was not meeting anaemia management targets despite implementing systems centred around reminding doctors of the need to address anaemia issues at clinic visits.

Method: The department's iron management protocol was revised and developed into a nurse-initiated protocol. The revised protocol was introduced in late 2004 and pre implementation blood test results for patients were compared to those of the February 2005 and October 2005 audit.

Results: There was a significant improvement in iron management resulting in higher haemoglobin levels and iron stores with a reduction in the usage of (expensive) erythropoietin replacement medications.

Conclusion: Due to the positive outcomes from the implementation of this protocol, nurses have developed a new sense of their role in dialysis patient care. This will allow further nurse-initiated protocols to be developed to more effectively manage other aspects of chronic renal failure.

Introduction

Anaemia is a significant problem in the life of chronic renal failure (CRF) patients. Erythropoietin is produced in the renal cortex in response to signals from a renal oxygen sensor. In CRF, this pathway is inhibited and the major cause of anaemia is a relative lack of erythropoietin (Whitworth & Lawrence, 1995). The consequences of anaemia in CRF include left ventricular hypertrophy, decreased survival rates, impaired immune function, disturbed sexual and

endocrine functions, decreased cognition and reduced quality of life (Toto, 2003).

Erythropoietin replacement therapy (ERT) has been a major advancement in the treatment of anaemia and has been used in CRF since 1990. ERT is a schedule 100 medication provided to people with CRF at a greatly subsidised cost. ERT comes in injectable form and for patients on haemodialysis it is administered directly into the bloodlines. For ERT to be effective, adequate iron stores are required. Failure to constantly

Key Words

nurse initiated, iron management, hospital haemodialysis

achieve adequate iron stores has limited the management of anemia in CRF. Iron deficiency occurs as a result of CRF impairing dietary iron absorption in the gastrointestinal tract. Additionally, iron is lost during the process of haemodialysis as a consequence of frequent blood tests, blood remaining in the dialysis circuit after dialysis and bleeding from cannulation sites (Dawborne, 1995).

St George Hospital is a major Sydney teaching hospital, which provides hospital haemodialysis for an average 130 patients. The Department of Renal Medicine's quality assurance (QA) coordinator has tracked the biochemical and haematological results for patients on hospital haemodialysis (HH) since 2001. The results are benchmarked against the unit's past audits, national guidelines for the management of people with renal impairment (CARI, 2005) and Australian and New Zealand data (ANZDATA). The six monthly review conducted in August 2004 indicated that HH patients' iron studies were not reaching acceptable targets despite having increased the unit's awareness of this problem over a two year period.

Following the presentation of the August 2004 review, it was decided to concentrate on improving the anaemia

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management of patients on HH through changing the iron management protocol and developing a nurse initiated intravenous iron management protocol. Nurses as the primary health professionals caring for HH patients were seen as the appropriate group to monitor iron management in these patients.

Method

The actions required to improve the results from the August 2004 review were:

- Implementation of a more frequent rate of iron repletion - 100mg IV iron given for 10 consecutive haemodialysis sessions;
- A maintenance program for haemodialysis patients who are iron replete (Ferritin 100-800 ug/l, TSAT 20-50%);
- An increase in the target range haemoglobin to 110-130g/l and;
- Development of a nurse-initiated IV iron protocol required to manage the changes.

A working party comprising the QA coordinator, acting Nephrology Clinical Nurse Consultant (CNC), and a nephrologist was formed to develop policy and oversee the implementation of the revised protocol. Changes were made to the iron management protocol and a comprehensive flow chart for iron administration was developed. This flow chart provided a guide for nurses in iron management.

Intensive inservice education was conducted within the HH unit and targeted all RNs. Additionally, all nurses were required to complete an anaemia management self-learning package. A nurse-initiated iron protocol was developed and ratified by the hospital drug committee and a form

for documenting and tracking iron administration was developed.

The revised protocol was implemented in November 2004 with a "hands off" approach from the medical team. Patients are reviewed in clinics regularly but medical input into anaemia management only occurs when the case is difficult or a prescription is required.

Results

The haematological markers for HH patients were audited in February 2005 and again in October 2005 and the results compared to those for August 2004.

In summary the findings from the October 2005 review revealed:

1. A rise in Hb levels with 61% of HH patients achieving target Hb range of 110-130g/l having a Hb greater than 130g/l. (Figure1).
2. A significant improvement in the proportion of patients achieving desired ferritin levels compared to the previous audit. There was an increase from 63% to 86% of patients achieving results in the 100-800 range and an increase from 25% to 44% in the 300-800 range (Figure2).
3. A marked improvement in the proportion of patients achieving desired transferrin saturation levels within the 20-50% range. 73% of patients achieved this target in the October 2005 audit compared to only 55% in the August 2004 audit (Figure 3).
4. A decrease in the average and median weekly Eprex (figure 4) and Aranesp (figure 5) doses occurred. These medications are the ERT medications used to manage a reduced Hb in the HH patient.

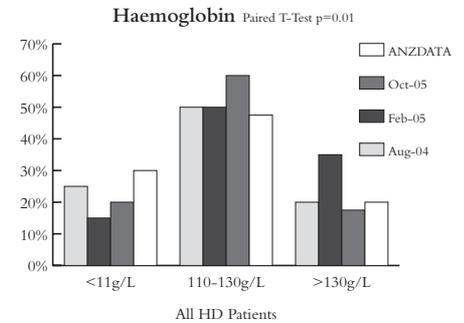


Figure 1: Showing increase in the percentage of HH patients' Hb

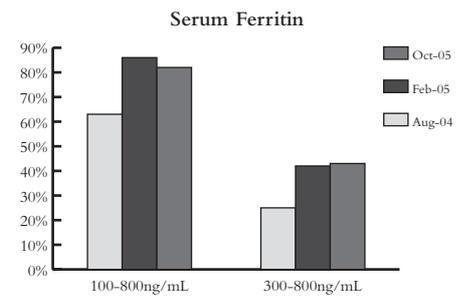


Figure 2: Showing improvement in ferritin levels between August 2004 and October 2005

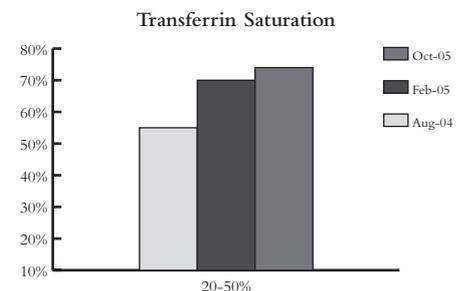


Figure 3: Showing improvement in transferrin levels between August 2004 and February 2005

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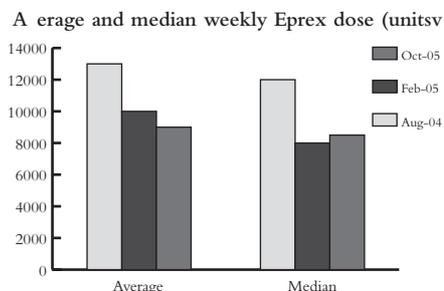


Figure 4: Showing decrease in the Eprex dose from August 2004 to October 2005

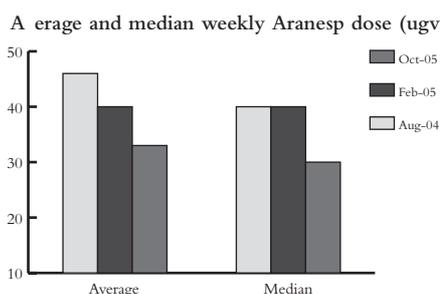


Figure 5: Showing decrease in the Aranesp dose from August 2004 to October 2005

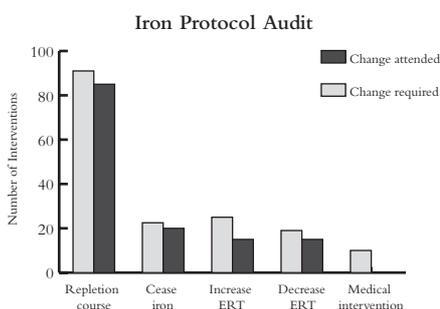


Figure 6: Results for audit of nurses' adherence to the iron protocol

5. Primary nursing is practiced in the HH unit and it is each nurse's responsibility to manage the iron protocol for his/her primary patients. The patients' results were audited to ascertain individual nurse's adherence to the protocol. This audit reviewed the changes to management required and whether there was any change actioned by the nurse. The audit revealed three RNs who had more than one primary patient with management issues. The CNC met with the three RNs and counseled them through the protocol.

A second audit was conducted in October 2005 (figure 6). This audit identified that the nurses continue to manage the protocol effectively. Additionally, this audit revealed areas in the protocol, which required re-education. The main area is where an increase in ERT is required. This is also reflected in the audit results for situations where medical intervention is required but not actioned.

Discussion

There were two initial barriers to change that had to be overcome when the iron management protocol was implemented. The first was the reluctance of some doctors to transfer this responsibility to nursing staff and the reluctance of some nursing staff to accept the responsibility of work which had previously been performed by doctors. This barrier was overcome by discussion amongst relevant staff highlighting the potential benefits to patient care. The second barrier was that the introduction of the protocol significantly increased the nurses' workload. A strategy to assist primary nurses in their surveillance and ongoing care planning was the introduction of the enrolled nurse. Prior to this time there were only registered nurses employed in the HH unit. The enrolled nurses are performing functions such as stocking

and setting up machines and this has assisted in freeing up time for primary nurses to enact the iron management protocol.

Conclusion

The nurse-initiated iron management protocol has resulted in a significant improvement in the anaemia management of patients on HH. The protocol will now continue as normal practice within the HH unit. Haematological markers will continue to be reviewed six monthly and the nurses' use of the protocol will be evaluated yearly. The department is currently implementing a similar iron management program in our peritoneal dialysis patients.

The success of the iron management protocol highlights the unique contribution nurses can make in improving the effectiveness of the management of patients with chronic illness such as dialysis patients. The iron management protocol is our first nurse-initiated protocol and there are plans to introduce further nurse-initiated protocols related to other aspects of patient management.

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