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ORIGINAL ARTICLE

Blood volume extracted from the critical patient in the first 24 hours after admission☆

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Abstract
Objective: To calculate the number of analytical tests and blood volume drawn during the first 24 h of admission to the Intensive Care Unit (ICU). To analyse values of basal haemoglobin and at 24 h, relate them to blood loss, weight variation, and scoring system.
Method: An observational descriptive pilot study. Variables studied: age, sex, diagnosis on admission, analytical tests extracted, waste quantity before the extraction of samples, total volume blood extracted in 24 h, weight variation, APACHE, SAPS, basal haemoglobin and at 24 h. Statistical analysis with SPSS vs 20.0. Variables correlation sex, weight variation, the number of analytical tests and haemoglobin change.
Results: The study included 100 patients. The average number of extractions per patient/day was 7.2 (±2.6). The average waste quantity was 32.61 ml (±15.8). The blood volume used for determinations was 48.18 ml/24 h (±16.74). The haemoglobin value decreased in the first 24 h of admission, being higher in men ($P < 0.05$). The scoring systems were statistically significant for levels of haemoglobin (Hb1 −0.3; $P = 0.001$; Hb2 −0.4; $P = 0.001$).
Conclusions: Of the total volume of blood extracted in ICU, 40% belongs to a volume of waste and 60% of blood is used for analytical tests. There is a decrease in haemoglobin exists 24 h after admission of the critical patient. Statistically, it has not been possible to demonstrate its relation with the number of analytical tests.

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PALABRAS CLAVE
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Recolección de muestras sangre

Volumen de sangre extraído al paciente crítico las primeras 24 h de ingreso

Resumen
Objetivo: Calcular el número de analíticas y volumen de sangre extraído durante las primeras 24 h de ingreso en la unidad de cuidados intensivos (UCI). Analizar valores de hemoglobina basal y a las 24 h, relacionarlas con volumen de sangre extraído, balance ponderal e índices de gravedad.
Método: Estudio descriptivo, observacional y prospectivo. Variables de estudio: edad, sexo, diagnóstico de ingreso, analítica extraída, cantidad de desecho antes de la extracción de muestras, volumen de sangre total extraída en 24 h, balance ponderal, índices de gravedad, hemoglobina basal y a las 24 h. Análisis estadístico realizado mediante SPSS vs.20.0. Se han calculado las correlaciones de las variables sexo, balance, número de analíticas y variación de hemoglobina.
Resultados: La muestra estuvo formada por 100 pacientes. El número de extracciones medio por paciente/día fue de 7,2 (± 2,6). La cantidad media de desecho fue de 32,61 ml (± 15,8). El volumen medio de sangre utilizado para determinaciones fue de 48,18 ml (± 16,74). El valour de la hemoglobina disminuyó las primeras 24 h de ingreso, siendo mayor en los hombres ($p < 0,05$). No se pudo demostrar que el número de analíticas estuviera relacionado con la diferencia de hemoglobina a las 24 h. Los índices de gravedad tuvieron significación estadística en cuanto a los niveles de hemoglobina (Hb1: −0,3; $p = 0,001$; Hb2: −0,4; $p = 0,001$).
Conclusiones: Del volumen total de sangre extraída en UCI, el 40% pertenece a volumen de desecho y el 60% a sangre utilizada para analíticas. Existe una disminución de la hemoglobina a las 24 h de ingreso del paciente crítico, pero no se ha podido demostrar estadísticamente su relación con el número de analíticas.

What is known/what does this contribute?

Anaemia is the most frequent haematological pathology in patients admitted to an ICU. The causes are multifactorial, and the main mechanism is the increase in blood loss. The different reasons described for this include iatrogenic mechanism involved in successive extractions for analysis. During the first 24 h of admission to an ICU a large amount of blood is extracted from patients, and a large fraction of the extracted blood is eliminated.

This study offers a reflective view of managing the volume of blood extracted from critical patients. It centres on analysing the volume of blood extracted from critical patients during the first hours of admission, making it possible to analyse the repercussions this has in our patients.

Implications of the study

Undertaking an analysis of the situation of medical practice will make it possible to detect the real levels of blood loss and raise the awareness of the professionals involved of the importance of rationalising extraction for analyses, to reduce blood loss and prevent iatrogenic anaemia.

Introduction

The World Health Organisation (WHO) defines anaemia as a haemoglobin (Hb) level below 13 g/dl in men and 12 g/dl in women.[1] The prevalence of anaemia in critical patients is high, and from 40% to 70% of them require blood transfusions.[2] Some studies show that two thirds of the patients admitted to an intensive care unit (ICU) have a Hb concentration lower than 12 g/dl on the day of their admission.[3,4]

Intrahospital acquired anaemia (IAA) is one of the complications of critical patients. The cause of this is complex and multifactorial; it may be due to haemodilution, alteration in iron metabolism, nutritional deficiencies, a reduction in the half-life of erythrocytes or a fall in their production, inappropriate production of erythropoietin and blood losses secondary to haemorrhage or the taking of samples.[5] It is associated with negative outcomes, such as prolonged hospitalisation and increased mortality.[6]

Blood is extracted every day in ICUs for diagnostic and therapeutic purposes. Some authors associate IAA with the high number of blood extractions for diagnostic purposes.[7–9] These analyses are fundamental for the management of critical patients; nevertheless, from 50% to 60% of these extractions are considered unnecessary.[10] Rhagavan and Marik state that repeated phlebotomies may cause a loss of 25–40 ml blood per patient per day.[11] Vincent et al.[12] state that the highest volume of blood is extracted from critical patients during the first 24–48 h. As nurses we ask ourselves what repercussion blood losses due to diagnostic