

Assessment of Albumin Use in Critical Care And General Units of Baqiyatallah Hospital and Efficacy of Implementing Standard Administration Protocol on Administration and Use of This Drug

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Abstract

Background: Albumin is a low weight protein which regulating the volume and extracellular fluid balance with its role in plasma oncotic pressure. Protein malnutrition, severe inflammation, renal and hepatic failure could cause low serum level of albumin, on the other hand albumin intravenous administration savior in critically ill patients. According to its cost it is so important to use this valuable drug in correct indication. **Method:** this cross-sectional, prospective study was conducted for 1 year in Baghiatallah Alazam hospital. All patients received albumin in all hospital ward were included and data was gathered according to the designed form. Finally, all data in similar month of 2016 and 2017 year were compared and analyzed by version 16 of SPSS. **Result:** 264 patients with mean age of 57 y/o were enrolled in this study. All the prescription was matched to the mentioned indication in designed form. Plasmapheresis and nephrotic syndrome were the most frequent cause of albumin prescription, consequently kidney transplantation ward was utilized the highest number of albumin. total of used vials in 2017 fallen more than half in comparison with 2016. **Conclusion:** The aim of this study was to evaluate the pattern of albumin use in 17 sections of Shariati Hospital, which resulted in a significant percentage of uncontrolled and unreasonable administration of this drug in these patients was in line with other studies all over the world. Therefore, continuing studies of DUE, although it costs, are necessary because it benefits the health system in the long run. The role of hospital pharmacists in reducing drug misuse and conducting DUE studies is deniable.

Keywords: Albumin, Critical Care, Baqiyatallah Hospital, Protocol, Drug.

Introduction

Since 1986, American Society of Health System Pharmacists (ASHP) introduced DUE studies to avoid wasting valuable drugs which would be helpful to evaluate the medical indication.(Phillips and et al., 1996)

Pharmacists are key person for supervising DUE studies because of their surrounding science in kinetic, toxicology, pharmacology and pharmacotherapy.(Bachhav & Kshirsagar, 2015) According to the JCAHO protocol, pharmacists have to evaluate the accuracy of indication before prescribing (Tyler & Nickman, 1992).

DUE research would promote health care level in addition to rationalizing use of drug and possibilities which is leading to cost reduction. The cost of drug therapy is about 6-8% of total health care cost.(Cutler and et al., 2018)

Albumin is a low weight Protein which is the most abundant one in human plasma (Lee & Wu, 2015). It can regulate the volume and extracellular fluid balance with its role in plasma oncotic pressure (Caironi & Gattinoni, 2009). Human albumin solution has large variety of clinical indications such as Burn, Thermal injury, Plasmapheresis, Cardiac Surgery, hepatorenal syndrome, Nutritional Intervention, Hemorrhagic /Hypovolemic Shock, Septic Shock and nephrotic syndrome.(Finfer and et al., 2010) Due to its vital wide effects, Albumin is known as worth drug with significant impact on patient's mortality which makes cost for Health care system and by the end of 2018, the HSA market will likely exceed \$50 billion.(Caironi & Gattinoni, 2009; Chien and eta l., 2017).

For all reasons mentioned above, we decided to perform DUE on albumin to evaluate the correctness of indication in Baghiatallah Alazam hospital.

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Method:

this cross-sectional, prospective study was conducted in Baghiatallah Alazam hospital from July 2016 to December 2017. All patients received albumin in all hospital ward were included in the study. In the first phase of this study, which lasted for 6 months, drug use evaluation (DUE) was performed. At this stage, patients' information was obtained through examination of patients' files, as well as questions from the doctor and nurses. The results are then evaluated by a committee of experts including a pharmacist, an internal specialist (gastroenterology, rheumatology, etc.), a specialist care unit, a nursing service (metron), pharmacy management, and the head of nephrology and neurology department who are most in need Albumin have been studied. During the meetings and study of similar interventional and observational studies in the world and Iran, a standard protocol for the administration of albumin was developed and it was announced to the various departments of the hospital. In the second phase of this study, the status of albumin in the same ward and in the same period, according to the communicative protocol, was reviewed by the regulatory team appointed by the Medicines and Treatment Committee. Then, the amount of albumin intake, as well as information related to the indication and dosage, were compared before and after the protocol.

Data Analysis

Statistical analysis was carried out using Microsoft excel 2017 for windows release.

Result:

264 patients with mean age of 57 y/o were enrolled in this study. 57.9% of patients was male and 42.1 was female. The cases in which albumin was prescribed for them include: Plasmapheresis (26%), Nephrotic Syndrome (21.6%), Diarrhea (11.7%), Liver Syndrome (11.8%) (Spontaneous bacterial peritonitis) (5.74%). Total vials consumed during the same period in year 2017 and 2016 was 2514 and 7342 respectively. Most of the prescriptions were for the kidney transplant section, 556 of 2514 vials were consumed in this segment, and 42.7% of patients received albumin. Afterwards, emergency ward and ICU2 took more vials.

The below table shows prescribing albumin for various indications:

Table 1: albumin prescription for various indications

Indication	No. prescription	No. consumption	Consumption%
Plasmapheresis	155	659	26.2
Nephrotic syndrome	221	542	21.6
diarrhea	87	295	11.7
Hepatic syndrome	116	297	11.8
SBP	43	112	4.5
others	130	327	13
hypoalbuminemia	14	34	1.4
Cardiac surgery	11	22	0.9
ARDS	21	66	2.6
Heart failure	2	4	0.2
transplantation	25	60	2.4
edema	2	3	0.1
After Para synthesis	36	88	3.5
Para synthesis	1	2	0.1
Sepsis Shock	1	2	0.1
Non hemorrhagic shock	1	1	0.0

After the program, the number of vials consumption declined significantly and dropped by a total of 65%. In the following table, the number of albumin vials compared in the same months in 2016 and 2017.

Discussion:

The albumin shortage in the country and the widespread use of the drug in accordance with the misuses intake as a consequence of its complications, justified the need to pay attention to this drug and study further on it. In this study all albumin administration was based on the correct indication. In our study, the nephrology section had the highest number of albumin intake which was in line with other trials.(D BCPS and eta l., 2012) Albumin should not be considered as a supply because it is slowly broken down and contains a small number of essential amino acids, and in large quantities it may increase catabolism.(Aramwit, P., & Kasattrat, N. (2004) In addition, in chronic protein deficiency is not effective, but some studies show albumin were prescribed for hypoalbuminemia and malnutrition which

is not approved. In some research, albumin increase mortality rate when use for Hypovolemia, burn or hypoalbuminemia (Vincent and et al., 2005; Dastan, and et al., 2018).

The excessive use of albumin can impose significant economic losses on the health care system and patients.(Pulimood, T. B., & Park, G. R. (2000) To evaluate the rational albumin prescription, number of studies were conducted all over the world. In these studies, albumin consumption was compared before and after the protocol compilation and all the results were in favor of a 70 to 90 percent reduction in hospital cost on albumin intake.(Vincent and et al., 2003; Lyu and et al., 2016; Charles and et al., 2008).

The aim of this study was to evaluate the pattern of albumin use in 17 sections of Shariati Hospital, which resulted in a significant percentage of uncontrolled and unreasonable administration of this drug in these patients. Therefore, continuing studies of DUE are necessary for them. The implementation of such studies is definitely costly, but in practice and in the long run will not only reduce part of the hospital's waste costs but also improve the physical and mental health of the patients. A complete and desirable study of a DUE study will not be possible unless the hospital pharmacist plays his part in leading and conducting the study.(Dalton & Byrne, 2017) Pharmacists should be able to act in the field of guidance to help the medical staff to remedy existing deficiencies (Guérin and et al., 2015; De Rijdt and et al., 2008).

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