INTERNATIONAL JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH
ISSN: 2395-6429, Impact Factor: 4.656
Available Online at www.journalcmpr.com
Volume 8; Issue 07(A); July 2022; Page No.340-342
DOI: http://dx.doi.org/10.24327/23956429.ijcmpr20220078

Research Article

HYPOALBUMINEMIA IN THE UNDERNOURISHED ELDERLY PERSON IN INTENSIVE REHABILITATION: A CASE SERIES RETROSPECTIVE ANALYSIS FOR A HEALTH LEAN MANAGEMENT APPROACH IN REGIONE CAMPANIA, ITALY

Luigi Di Lorenzo[1], Cocozza Raimondo[1], Andreina Maisto[2], Rosa Alessandro[2] and Barbieri Michelina[4]

[1]U.O. Rehabilitation Unit Hospital Sant'Alfonso , Sant'Agata dei Goti AO San Pio BN
[2]MD A.O. San Pio Hospitals & Social Service Municipality City of Benevento, Italy
[3]Psycologist, CME Orientacampus.it with e-Campus UNIVERSITY, Italy
[4]UOC Farmacia AO San Pio Presidio Osp.Sant'Alfonso Maria dei Liguori

ARTICLE INFO

Article History:
Received 13th April, 2022
Received in revised form 11th May, 2022
Accepted 8th June, 2022
Published online 28th July, 2022

Key words:
Hypoalbuminemia, rehabilitation nutrition, Lean Management in Renabilitation

ABSTRACT

Introduction: For several years, human albumin was administered to patients to intervene on oncotic pressure and intravascular volume (1) until an article published in Cochrane in 1998 signaled to the scientific community that its administration could be dangerous in critically ill patients compared to use of crystalloids. In recent years, in which costs are dominating, influencing clinical choices, Hospitals are changing "register" and protocols. Our San Pio di Benevento Hospitals for example, has recently tightened its belt by adopting a stringent protocol adhering to the dictates of the AIFA note 15 (Italian Minister of Health) and to international guidelines. The Protocol obviously has in its premises the purpose of improving the appropriateness of the clinical use of Human Albumin as a priority of the national and regional health system as well as an objective of the S.S.N. **Materials and Method:** To this end, for cognitive purposes, in our company we retrospectively analyzed the data relating to a cohort of patients over 75 after major orthopedic surgery followed in the year 2020-2021. **Results:** The association of serum hypoalbuminemia - hyponutrition and IV supplementary treatment (OR = 0.03) as the first choice was to be classified as a very strong association and in general the therapeutic choice extremely different from recent company indications (Chi - box 9.899, p0.0017, OR 0.03). **Conclusions:** all Italian hospitals have regulated the use and request of Human Albumin in accordance with the International and National Guidelines and AIFA Note 15 (12). The indications are exhaustively shared and explained and the necessary dose dose is calculated by applying a dedicated formula that we here report. The message is That all recent protocols have to limit improper use in the absence of certainties, if only for the certainly high cost of the drug. However, pending new and stronger evidence, compared to the past Albumin will continue to be considered as an additional weapon in selected cases promoting always a Lean Managemene based approach.

INTRODUCTION

For several years, human albumin was administered to patients to intervene on oncotic pressure and intravascular volume (1) until an article published in Cochrane in 1998 signaled to the scientific community that its administration could be dangerous in critically ill patients compared to use of crystalloids. (2). The skein then remained entangled since the conclusions of subsequent works were not unambiguous (3). In recent years, in which costs are dominating, influencing clinical choices, Hospitals are changing "register" and protocols. Our San Pio di Benevento Hospitals for example, has recently tightened its belt by adopting a stringent protocol adhering to the dictates of the AIFA note 15 (Italian Minister of Health) and to international guidelines. The Protocol obviously has in its premises the purpose of improving the appropriateness of the clinical use of Human Albumin as a priority of the national and regional health system as well as an objective of the S.S.N. published in Official Gazette No. 9 of January 2017. The analysis of data on the use of Albumin in fact has shown in recent years a high and higher consumption in some italians Regions such as Regione Campania. According to the Istituto Superiore di Sanità, Regione Campania is the Italian region with the highest consumption, exceeding the national demand by 78% (4). Albumin is an important plasma substitute for whole blood and in clinical practice it is used to treat hypovolemia and to correct hypo-albuminemia. Proper use is, however, controversial. In a nice and interesting italian article, the author (5) sympathetically reminds clinicians that .. "I don't know a primary who doesn't

Corresponding author:* **Luigi Di Lorenzo
U.O. Rehabilitation Unit Hospital Sant'Alfonso , Sant'Agata dei Goti AO San Pio BN

scowl at you when you use a bottle of albumin ... the beauty is that you don't have much literature to counter it ...". In support of his, the author recalls the 2004 SAFE study (6), conducted using 4% albumin versus normal saline, which concludes on the safety of albumin use in critically ill patients as well as the Dubois study (7) which reinforced the concept by underlining the benefits linked to the maintenance of values> 30 g / L. The discussions are obviously promoted by the limited availability that it presents compared to other therapeutic strategies such as crystalloid and synthetic colloid solutions, by its high cost and from inappropriate use. Among the many practices encountered by clinicians as well as the purpose of the following corporate cech that we share in this article, there is certainly without fear of denial, a documented practice of incongruous treatments underlying the hyperuse found in Campania and beyond. These include precisely the approach to hypoalbuminemia in elderly patients following major surgery usually suffering from hypoalbuminemia and undernutrition in the 4 weeks following surgery during which albumin is often still too often administered improperly.

MATERIALS AND METHOD

To this end, for cognitive purposes, in our company we retrospectively analyzed the data relating to a cohort of patients aged over 75, after major orthopedic surgery followed in the year 2020-2022 . In the 2020-2022 cases carried out from January 2020 to March 2022 in the Intensive Rehabilitation Unit of the San Pio di Benevento Company at the Sant'Agata dei Goti Hospital, the patients hospitalized in ordinary hospitalization code 56 (post acute intensive rehabilitation) in 2020 and 2021 as a result of major orthopedic surgery and suffering from hypoalbuminemia and hyponutrition in the 4 weeks following surgery during which they underwent intensive rehabilitation treatment. The aim was to verify whether the treatment of hypoalbuminemia associated with hyponutrition was indispensable, in compliance with company guidelines and interpreted by Physicians as a potential improvement in the effectiveness of physiotherapy and clinical management in general. None of the Medical Specialists had been given any indication of the pharmacological modalities of treatment, and despite the widespread company indications of the last decade, as recalled in the recent and stringent Company Protocol relating to the year 2022 (severe hypoalbuminemia equal to score <2, 0 mg / dl). For each patient considered in the study, we checked that he had previously been evaluated by the psychologist of the ward through the administration of validated evaluation forms, in order to exclude those in which hyponutrition was linked to psychiatric problems or dementia. Undernutrition and the number of laboratory tests required was unclear and may depend on the patient's situation. If the cause was obvious and correctable, tests are likely to be of little benefit. Other patients might require a more detailed evaluation. Serum albumin assay was clearly the most commonly used laboratory test, and decreases in serum albumin and other proteins (eg, prealbumin [transthyretin], transferrin, retinol-binding protein) might indicate a protein deficiency or a protein-energy malnutrition (3,4). As undernutrition progresses, albumin slowly decreases; prealbumin, transferrin and retinol-binding protein decrease rapidly (4-7). Measuring albumin is inexpensive and predicts morbidity and mortality better than measuring other proteins. However, the correlation of albumin with morbidity and mortality may be related to both non-nutritional and nutritional factors. The inflammation produces cytokines that cause the extravasation of albumin and other nutritional protein markers, decreasing their serum levels(6,7).Since prealbumin, transferrin, and retinol-binding protein decrease more rapidly during starvation than albumin does, their measurement is sometimes used to diagnose or assess the severity of acute starvation(7). However, it is unclear whether they are more sensitive or specific than albumin. Total lymphocyte counts can be calculated, which often decreases as undernutrition progresses. This produces a marked reduction in CD4 + T lymphocytes, and therefore this count is not useful in patients who have AIDS. Other laboratory tests, including measuring vitamin and mineral levels, are used selectively to diagnose specific deficiencies (3).

RESULTS

In fig.1 we report the data extracted from global corporate consumption (all Operating Units) and referring to the last half-year (last quarter 2021 and first quarter 2022) following the issuance of the Company determination and the new protocol, which shows how correct information training significantly affects and favors a Lean Management approach . The data relating to the scores studied (hypoalbumineamia if value <2.4 mg / dl, hyponutrition (weight loss and global reduction of values at the protidogram) and any associated supplementary treatment with IV albumin), were analyzed in a contingency table 2 x2 suitable to calculate probability coefficient (if p <0.005) and Odds ratio and verify if in the medical conduct there was an association between standard therapeutic treatment (simple monitoring of hypoalbumimemia with indications for dietary supplementation and / or crystalloids in case of iovolemia) compared to a treatment of hypoalbuminemia treated simply with Human Albumin and without emphasizing the nutritional aspects and hydration with crystalloids.

MEDICINA D' URGENZA	338	308
MEDICINA INTERNA	515	424
NEUROCHIRURGIA	22	6
NEUROLOGIA	143	180
NEURORIANIMAZIONE	20	246
ONCOLOGIA MEDICA	151	126
ORTOPEDIA E TRAUMATOLOGIA	130	79
OSTETRICIA E GINECOLOGIA	56	42
OTORINOLARINGOIATRIA	0	12
PNEUMOLOGIA	55	250
PS-BREVE OSSERVAZIONE	70	188
REUMATOLOGIA	0	15
UROLOGIA	0	163
TOTALE	117	3.068

AZIENDA OSPEDALIERA SAN PIO BENEVENTO

PO SANT'AGATA		
UNITA' OPERATIVA	IV TRIM 2021	I TRIM 22
S_A_CHIRURGIA GENERALE	20	0
S_A_MEDICINA GENERALE	304	171
S_A_RIABILITAZIONE	15	30
TOTALI	339	201

The calculated odds ratio was used as a ratio index between the frequency with which an event occurs in a group of patients and the frequency with which the same event occurs in a group of control patients, referring in particular to the 'eventuality of IV administration of Albumin in case of non-critical hypoalbuminemia values indicated in the guidelines and in the company protocol (i.e Hypoalbuminemia if score = <2.4 mg / dl). On the basis of the aforementioned scheme of interpretations, the association of serum hypoalbuminemia - hyponutrition and IV supplementary treatment (OR = 0.03) as the first choice was to be classified as a very strong association and in general the therapeutic choice extremely different from recent company indications (Chi - box 9.899, p0.0017, OR 0.03).

DISCUSSION

Albumin is known among doctors for its role in maintaining oncotic pressure, as a carrier of various endogenous and exogenous substances, with antioxidant and anti-inflammatory properties, as a scavenger for toxic substances and a buffer role in the acid-base balance. In fact, among the recent literature stands out a RCT from New England studying a population of patients with severe sepsis / septic shock and the effects on mortality of the administration of albumin and crystalloids, compared with crystalloids alone, having as target a serum albumin value not lower than 30g / l (8). In Italy, on the other hand, we recall the ALBIOS study (9) involving 100 Italian intensive care units and which found no differences in results in the various critical intensive care outcomes with the exception of the suspension of vasopressors and inotropes which occurred earlier in the albumin group. Recently things seem to change: in 2011 Delaney's meta-analysis (10) comes out and in 2012 the guidelines of the Surviving Sepsis Campaign (11) come up with the indication to consider filling with albumin (albeit with a recommendation level 2C) when large quantities of crystalloids are administered. Hypoalbuminemia is frequently observed in hospitalized patients and can be traced to multiple causes (reduced synthesis, increased losses, increased catabolism) but the mechanism is not yet well defined. What is certain is that hypoalbuminemia is associated with inflammation which increases capillary permeability and the loss of serum albumin. Therefore, the increase or decrease in serum albumin is an expression of improvement or worsening of the clinical status, especially in the elderly. However, with the administration of albumin, a reduction in the request for fluids, in the rate of infection and in the mortality of the critically ill patient has not been demonstrated. Ultimately, hypoalbuminemia in itself is not a condition that justifies the therapeutic use of albumin. The indications are specified in AIFA Note n.15 and in particular it can be used in two groups of clinical conditions: acute and chronic with low albumin (liver cirrhosis, nephrotic syndrome, malnutrition). The rationale for use is in any case linked to its action on oncotic pressure and the expansion of plasma volume and its regulatory function of acid-base balance. In general, albumin should not be used for nutritional purposes and in major surgery it is indicated in patients only if, after normalization of the volume, the albumin is less than 2.5g / dl, where the first choice therapy they are crystalloids as colloids determine a greater risk of complications (IRA, EPA, impact on coagulation) without improving the outcome, as evidenced by the scientific literature (12). In the elderly, after major surgery, cardiac function and a possible use for hypovolemia should be considered as a last choice for volume expansion after crystalloids and non-protein colloids and under certain conditions (Note 15). In the post-operative major surgery patient, in general, the use of albumin in the immediate postoperative period is not recommended for any type of surgery. In the malnutrition of the elderly operated on for albuminemia, other factors must ultimately be corrected (12).

CONCLUSIONS

All hospitals and ours recently (12), through specific protocols, have regulated the use and request of Human Albumin in accordance with the International and National Guidelines and AIFA Note 15 (13). The indications are exhaustively shared and explained and the necessary dose dose is calculated by applying the formula Dose (g) = ((Desired albumin (g / L) - current albumin (g / L)) x plasma volume (0.004L / kg) x 2 (If available Albumin or calculate with protidemia). The dose thus calculated will be administered in such a way as not to exceed 0.5g / kg / day at an infusion rate not to exceed 10g / h, with the exception of particular clinical situations (Source : Internal Protocol of the Pharmacy Operating Unit for the Units of the Azienda San Pio Benevento, 2022). As wisely reported (5) "it will be difficult to oppose the way to" fill "the critically ill patient with albumin" but the protocols will have to limit improper use in the absence of certainties, if only for the certainly high cost of the drug. However, pending new and stronger evidence, compared to the past Albumin will continue to be considered as an additional weapon in selected cases and it is essential that these ev ideas are shared as much as possible with clinicians of any discipline so that a Lean Managemene based approach is promoted even in hypoalbuminemia.

Reference

1. Comite P. *et al*. Albumina: produzione e terapia in era Pandemica. Progress in Critical Care. Vol.2 n.1 Dicembre 2021.
2. Cochrane Injuries Group Albumin. Reviewers Human albumin administration in critically ill patients: systematic review of randomised controlled trials BMJ. 1998 Jul 25;317(7153):235-40.
3. M Wilkes, R J Navickis. Patient survival after human albumin administration. A meta-analysis of randomized, controlled trials Ann Intern Med 2001 Aug 7;135(3):149-64.
4. Cardura F. *et al*, Analisi della domanda dei principali medicinali plasmaderivati in talia. 2019 Rapporti Istisan 21 ISSN: 1123-3117 5 Seni S Albumina Si, Albumina NO. Empills 2014 https://www.empillsblog.com/albumina-si-albumina/
5. Finfer S. *et al*. A comparison of albumin and saline for fluid resuscitation in the intensive care unitN Engl J Med 2004 May 27;350(22):2247-56
6. Dubois M., *et al*. Albumin administration improves organ function in critically ill hypoalbuminemic patients: A prospective, randomized, controlled, pilot studyCrit Care Med 2006 Oct;34(10):2536-40
7. The SAFE Study Investigators, A Comparison of Albumin and Saline for Fluid Resuscitation in the Intensive Care Unit N Engl J Med 2004; 350:2247-2256
8. ALBIOS Study Investigators, Albumin Replacement in PAtients with Severe Sepsis or Septic Shock , New England J Med 2014; 370:1412-1421
9. Delaney A The role of albumin as a resuscitation fluid for patients with sepsis: a systematic review and meta-analysis Crit Care Med 2011 Feb;39(2):386-91
10. Dellinger R. *et al*, Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock, 2012 Intensive Care Med 2013 Feb;39(2):165-228.
11. Barbieri M., Di Lorenzo L. Ipoalbuminemia dell'anziano iponutritoin Riabilitazione Intensiva: le aziende regionali cambiano "registro".Review narrativa. Journal Bollettino SIFO 2022 Vol.68 N. 2 Marzo-Aprile. Pensiero Scientifico Editore
12. Italian Minister of Health: Nota 15 Agenzia Italiana del Farmaco. Farmaco in nota: Albumina umana Agenzia Italiana del Farmaco https://www.aifa.gov.it/nota-15