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SYSTEMATICAL REVIEW OF THE EFFECTIVITYOF *Channa striata*EXTRACT CAPSULE TREATMENT TOWARDS ALBUMIN LEVELS OF BURN WOUND PATIENTS

Naufal Agus Isamahendra[1], Linda Hariani[2], Dwi Murtiastutik[3]

[1]Faculty of Medicine, Airlangga University
[2]Departemen/SMF Bedah Plastik Rekonstruksi dan Estetika. Faculty of Medicine Airlangga University
[3]Departemen Kesehatan Kulit Dan Kelamin. Faculty of Medicine Airlangga University

Abstract— Burns causes vasodilatation resulting in increased capillary hydrostatic pressure which causes increased capillary membrane permeability. This causes fluids and electrolytes in the intravascular out to the extravascular including Albumin, resulting in hypoalbuminemia. Hypoalbuminemia is a condition in which the albumin level in the blood is below 3.5 g / dl. Based on the National Formulary according to the 2017 Minister of Health regarding restrictions on the provision of infusion albumin, patients are given human albumin transfusion if the albumin level is less than 2.5 g / dl. A solution is needed to increase albumin levels other than through transfusion, provided that this albumin transfusion alternative is expected to be more economical and efficient than transfusion albumin which is notoriously expensive. *Channa striata* extract is a new product which is expected to be an alternative to this transfusion albumin. The aim of the study was to determine whether the administration of *Channa striata* extract capsules can increase the albumin levels in the blood in burn cases. This research uses a systematical review method by taking journals through various databases. The conclusion of this study is that *Channa striata* extract capsules can increase albumin levels in the body and accelerate wound healing in burn patients. The research that also found *Channa striata* extract capsules also decreases serum MDA levels and increasing nitrogen balance in a positive direction

Keywords: *Channa striata* extract, burns, albumin levels.

INTRODUCTION

A body part suffering from a burn injury would vasodilate due to inflammatory mediator stimulus that are released by endothelial cells, broken leukocytes and platelets, causing the hydrostatic pressure of the capillaries to increase which in itself causes membrane capilarry permeability to rise (ANZBA, 2016). This situation makes fluids and electrolytes to flow out from the intravascularies to the extravascularies. Albumin also flows out during this phenomenon, which causes burn patients to experience hypoalbuminemia. Albumin plays an important part in the process of metabolism inside body tissues. Some of its uses in metabolism inside tissues are to maintain oncotic pressure, bind and carry metabolite and drug molecules, and it can act as an anti coagulantand much more. Those functions also makes albumin a very important part in the process of wound healing. (Kramer, 2012 in Herndon, 2012). According toNational Formularium as stateted in Kepmenkes 2017 about the limitation of infused albumin, burn patients are given human albumin transfusion only if albumin levels are below 2,5 g/dl.We need a solution to increase albumin levels in burn patients aside from using albumin transfusions considering these limitations that are set by the government. One of the alternative routes we can take are giving patients *Channa striata* capsules by implementing them in the patient's diet. Some researchs suggests that *Channa striata* capsule can be effective as an alternative to human albumin transfusions compared to other alternatives such as egg whites (Susetyowati, 2006). Until now, there still isn't a *systematical review* to prove the effectivity of *Channa striata* capsule as a human albumin alternative. Based on the aforementioned background, we

would like to try understandthe effectivityof*Channa striata* capsules as an alternative to human albumin transfusions, hoping that one day this research can be used as a reference for further research on this topic and the development of *Channa striata* as a legitimate hypoalbuminemia therapy in burn injury cases.

METHODS

Type of Study

This study is a Systematic Review study which strives to evaluate the effects of *Channa striata* on albumin levels inside the blood plasma of a burn injury/wound patient.Studies that are included in this review are Randomized Controlled Trial studies, Controlled Observational Studies, Retrospective studies, and Prospective Cohort studieswhich analyzes and compares the efficacy of *Channa striata* extract capsules towards albumin levels of a burn injury/wound patient.

Research Method

Formulation of the*Research Question (RQ)* of this study is based on 5 elements calledPICOC:

Population (P) : Journalswhich studies the effect of *Channa striata* treatment on burn patients.
Intervention (I) : Treatment using*Channa striata*extract capsules
Comparison (C) : Albumin levels of burn patients which are given human albumin transfusions or other alternatives aside from *Channa striata* extract capsules.
Outcomes (O) : The rising of albumin levels
Context (C) : Journal database

Based on the PICOC elements, we established keywords to be used during the process of literature search, which are “Ekstrak *Channa striata* (*Channa striata* extract)”; “Kadar albumin (albumin levels)”; “Luka bakar (burn wound)”; the journals that we are searching for and will be using are from 2015-2020.

Inclusion criteria of this study are:

1) Studies which evaluates the effects of *Channa striata* extract capsules on albumin levels in burn patients;
2) Studies which evaluates the effectiveness of Channa striata extract as an alternative to human albumin;
3) Studies which evaluates the effectiveness of Channa striata extract as an alternative to human albumin compared to other alternatives;
4) Studies taken from PubMed, MEDLINE and other various databases that are available publicly (Google Scholar, Univeristy databases, ScienceDirect etc).

Exclusion criteria of this study are:

1) Related studies which are published in languages not in English or Indonesian;
2) Related studies without a clear ethical feasibility.

The filtering process of literatures, in addition to the inclusion and exclusion criteria, must also carry out a quality assessment of all related literature found. The literature quality assessment should be based on the five parameters below:

- Is the data analyzing process done correctly?
- Are there also any residual and sensitivity analysis?

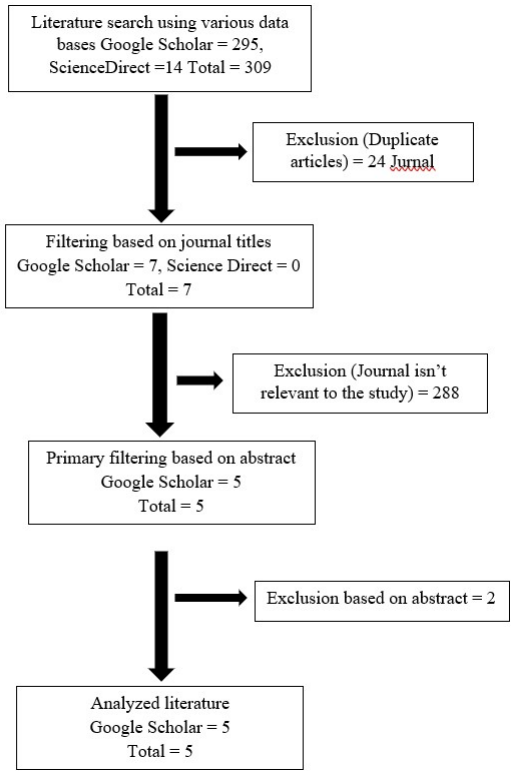
- Is statistical accuracy derived from raw data?
- How adequate are the comparison methods done in the study?
- What is the size of the dataset used in the study?

RESULTS

Literature Selection

Literature search is done using the Preferred Reporting Items for Systematic Reviews and Meta Analysis method or PRISMA for short. Literature search is done using Google Scholar, ScienceDirect, and PubMed on the 12th and 16th of February 2021 The PRISMA flow diagram which describes the process of literature search and selection is depicted in Picture 5.1 During the literature search process, we manually obtained 295 journals from Google Scholar's database, 0 from PubMed and 14 from ScienceDirect using the established keywords by directly entering the keywords one by one or combining them together using the search functions of each databases. Evaluation results towards duplicate articles shows that there are 24 duplicate journals which are excluded from the study. The next evaluation is done by analyzing each literature which we obtained using the established keywords.Evaluation is based on the abstract and quality assement of the journal resulted in 5 literatures which wil be used in the study. The results of these 5 literature are as follows; 1st literature: The Advantages of Snakehead Fish Extract Supplements Towards Albumin Levels, MDA Levels on 2nd Degree Burn by Awan*et.al* (2014). This study shows albumin levels to increase by 0,53 g/dl on the treatment group after given snakehead fish (*Channa striata*) extract with a dose of 3 x 1 capsule per day for 14 days. On the contrary the control group suffers a decrease of 0.16 g/dl of their albumin levels. 2nd literature: Test of Burn Wound Healing Effects of Collagen From Snakehead Fish (*Channa striata*) Bone in The Preparation of Cream on Male White Rats (*Rattus norvegicus*) by Hasri *et al.* (2020). This study shows the effectivity of *Channa striata* extract in the form of 3%, 5%, and 7% cream on a rat model which are given 2nd degree burns with a 2 cm diameter using heated metal. The 3% *Channa striata* cream was more effective at healing the wound than the 5% and 7% cream. 3rd literature: Improvement of Albumin Levels of a Post Amputation Patientet Causa 25% 3rd degree Electric Burn with Poor Nutritional Status Using High Protein Intakeby Paparang et al. (2018). This study observes an amputation patient caused by an 3rd electric burn injury with poor nutritional status. The patient is given high caloric diet 316,25 gr (55% of total energy requirement), high protein 88,8-111 gr (17,5%-22% of total energy requirement) and fat around 59 – 70 gr (23 – 27,5% of total energy requirement). The patient is also given additional supplementations of vitamin C with a dose of 1 gr/24 hours, vitamin A with a dose of 6000 IU/12 hours, vitamin B1 with a dose of 100 mg, vitamin B6 with a dose of 200 mg, vitamin B12 with a dose of 200 mg, zinc with a dose of 50 mg/24 hours, selenium with a dose of 55 µg, curcuma with a dose of 400 mg/8 hours, and snakehead fish extract (Pujimin®) with a dose of 2 capsule/8 hours. The patient's albumin level increased from 2,6 g/dL to 3,3 g/dLafter the 16th day of treatment and reached normal levels after the treatment period ends with an albumin level of 3,9 g/dL. Optimal nutritional support (high calorie and high protein) combined with vitamin A, B, C, Zn, Se and snakehead fish extract accelerated the wound healing process, slows down the process of infection from forming and it also increased the patient's albumin levels. 4th literature: The Effect of Zinc, Vitamin C, and Snakehead Fish Extract Towards A Grade 2A-B Burn Wound Patient's Nitrogen Balance by Effendy et al. (2015). The sample of the study is divided into 3 groups. The groups are divided as such: group A is given 4,5 g of snakehead fish extract and 60 mg of vitamin C, group B is given 4,5 g of snakehead fish extract and 20 mg of zinc, and group C is given placebos. Each group consists of 16 people which are given standard hospital diet and education for 14 days of intervention period. The study shows a decrease in Urea Urine Nitrogen (UUN) average of the intervention group, meanwhile the placebo group experience an increase instead. 5th Literature: The Role of Zinc, Vitamin C, and Snakehead Fish Extract Supplementation Towards Serum Zinc

Levels and Malondialdehide Levels of A Grade 2AB Burn Wound Patient byNasir (2013). The sample of the study was divided into three groups. Group A is given 3 x 2 capsules of Pujimin® (*Channa striata* extract), 1 x 1 of 60 mg vitamin C capsule and nutritional education. Group B is given 3 x 2 capsules of Pujimin®, 1 x 1 capsule of 20 mg zinc capsule and nutritional education. Group C is given nutritional education only and a standard hospital diet without additional supplementations. Administration of 20 mg of zinc combined with 4,5 gram of snakehead fish extract per day during the whole intervention period shows the decrease in MDA levels and an increase in zinc serum on a burn patient. In the group which are given vitamin C combine with snakehead fish extract supplementation and the group which are not given any additional supplementation shows an increase in their MDA levels.



Picture 5.1 PRISMA flow diagram

DISCUSSION

The study conducted by Awan *et al*(2014) shows that there are changes to the albumin levels of a 2nd degree burn wound patient after administration of snakehead fish extract (*Channa striata*) with a dose of 3 x 1 capsule for 14 days. The study measures the patient's nutritional status using albumin levels, TNF-α, and Malondialdehide (MDA). Hasri *et al.* 's (2020) study shows a cream ointment made with 3% of snakehead fish bone collagen extract accelerates the wound healing process of burn wounds in white rats (*Rattus* norvegicus) 3% snakehead fish cream is more effective than 5% and 7% because a 2nd degree burn is a wet wound meaning it can become a medium for infections. Giving the wound a 5% or 7% snakehead fish cream would become a source of nutrition for the bacterias bacterias instead of healing the wound, therefore accelerating the infection process with its excess collagen content. The final result of the study shows that the group which are given 3% snakehead fish cream managed

to be healed after 15 days of intervention period, while the 7% and 5% group healed after 18 days, 3 days longer than the 3% group. Paparang *et al.*(2018) used a patient as the subject of his study. His patient was amputated due to a 3rd degree electric burn wound, the patient also has poor nutritional status. Paparang gave the patient an extra supplementation of snakehead fishwith a dose of 2 capsule per 8 hours for 16 days (4 x 2 capsule per day) accompanying the patients designated hospital diet to increase the patient's nutritional status. The patient's albumin levels before intervention is 2,6 g/dl and on the last day of intervention it increases to 3,9 g/dl or around 21.2 % increase. This study concludes that giving the patient optimal diet combined with administration of vitamins A, B, and C also Zinc, Selenium and snakehead fish extract supplementation can accelerate the wound healing process and prevent infection on a post-amputation patient caused by 2nd degree electric burn injury.Theses results matches this paper's hypothesis which is the increase in albuymin levels after administration of snakehead fish extract on a burn wound patient. The study conducted by Effendy *et al.* (2015) shows an increase in nitrogen balance in a positive direction after administration of snakehead fish extract with a dose of 4.5 g. Nitrogen balance can indicate whether the patient has a nutritional deficit or not because a healthy person will always excrete the same amount of nitrogen as the amount of nitrogen consumed if protein needs are met and this is called a balanced nitrogen balance (zero). This shows the occurrence of reduced protein catabolism in burn patients, where protein is needed to accelerate wound healing and replace cells damaged by burns. With reduced protein catabolism, the patient's body is predicted to recover quicker.

CONCLUSION

Based on the results of this systematic review, it can be concluded that: *Channa striata* extract capsules are effective in treating hypoalbuminemia in burn cases, *Channa striata* extract is effective in forms other than capsules in treating hypoalbuminemia, and *Channa striata* extract has a positive effect on wound healing.

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