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ALBUMIN AND AMINOLEBAN THERAPY IN CHRONIC LIVER CIRRHOSIS: DISTINCT AND COLLECTIVE INFLUENCES ON LIVER FUNCTION PARAMETERS

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Abstract

This study examines the distinct and collective influences of Albumin and Aminoleban on liver function parameters in patients with Liver Cirrhosis. Chronic liver cirrhosis is associated with hypoalbuminemia, malnutrition, ascites, hepatic encephalopathy, and progressive impairment of liver function. Albumin therapy is commonly used to improve circulatory stability and reduce complications such as ascites and renal dysfunction, whereas Aminoleban therapy helps restore amino acid balance and improve nutritional and metabolic status. Previous studies support the effectiveness of both therapies. Long-term albumin therapy improved survival and reduced complications in decompensated cirrhosis patients, while Aminoleban improved serum albumin levels and nutritional status in cirrhotic patients with poor response to conventional therapy. This quantitative observational study was conducted at Allied Hospital I Faisalabad after obtaining official permission from the hospital administration. A total sample size of 40 chronic liver cirrhosis patients was selected through convenient sampling technique. Data were collected using structured data collection sheets including liver function parameters such as serum albumin, bilirubin, MELD-Na score, Child-Pugh score, ascites, and hepatic encephalopathy. The collected data were analyzed using Microsoft Excel and results were presented in tables and graphic forms for better interpretation. The findings of the study showed improvement in serum albumin levels, nutritional status, and liver function parameters among patients receiving albumin and Aminoleban therapy. Combination therapy demonstrated comparatively better outcomes in reducing complications and improving overall patient condition. The study concludes that both therapies play an important role in the comprehensive management of chronic liver cirrhosis patients.

1. INTRODUCTION

Liver cirrhosis is a long-term and worsening condition that affects the liver. It is marked by the development of irreversible scar tissue, the formation of abnormal nodules, and the loss of the liver's normal structure. This disease occurs due to ongoing damage to the liver cells, which can result from several causes such as chronic viral infections like hepatitis, long-term alcohol use, autoimmune conditions, metabolic disorders, and non-alcoholic fatty liver disease. The persistent inflammation and scarring gradually harm the liver's ability to function properly, leading to increased pressure in the portal vein, decreased ability to produce essential proteins, and various other complications affecting the whole body (Fleming et al., 2021).

The development of cirrhosis involves various molecular and cellular processes, including

ongoing inflammation, oxidative stress, poor function of blood vessel walls, and activation of specific liver cells. Continued injury to the liver leads to the excess buildup of connective tissue, causing progressive scarring and disrupting blood flow within the liver. As pressure in the portal vein rises, cirrhosis patients are at greater risk for serious problems such as fluid accumulation in the abdomen, enlarged veins in the esophagus and stomach, confusion due to liver disease, infections in the abdominal fluid, and kidney failure linked to liver disease (Pinzani et al., 2021).

Recent studies have increasingly viewed liver cirrhosis as a condition that affects multiple body systems, not just the liver alone. In advanced stages, cirrhosis can impact the immune system, heart function, kidney function, and the body's ability to process nutrients. The weakened immune system in cirrhosis patients makes them more prone to bacterial infections and sepsis, which are major causes of death in those whose condition has worsened. Systemic inflammation and poor blood flow further worsen the disease and contribute to damage in multiple organs (Albillos et al., 2022).

Albumin has also been honored as an important carrier patch for endogenous and exogenous substances within the bloodstream. It binds bilirubin, adipose acids, hormones, medicines, and poisonous metabolites, easing their transport and detoxification. In liver cirrhosis, structural variations of albumin motes reduce this list capacity, leading to accumulation of dangerous substances and worsening systemic toxin. Therapeutic albumin administration may incompletely restore these transport functions and ameliorate metabolic balance in cirrhotic cases (Oettl & Stauber, 2021).

Aminoleban remedy has also been delved for its influence on protein- energy malnutrition constantly observed in advanced liver complaint. Malnutrition in cirrhosis results from disabled nutrient immersion, altered metabolism, and reduced salutary input. nutritive phrasings amended with BCAAs give a readily available energy source and support protein conflation while minimizing catabolic stress. These metabolic goods may contribute to bettered nutritive status and reduced clinical deterioration in habitual liver complaint (Plauth et al., 2022).

As In the case of cirrhotic patients, who may be affected with sarcopenia, Aminoleban therapy has been recommended as a nutritive intervention and is applied regularly through oral BCAA-enriched supplementation with the aim of stimulating muscle mass and strength, improving functional markers and the overall clinical problems in addition to a hepatology treatment (Ismaiel et al., 2022).

Long-term treatment with BCAAs may be beneficial in patients with advanced cirrhosis, with improved survival and reduced hospitalisation, especially if patients are hypoalbuminemia. Combining albumin treatment may further benefit these benefits by rapidly correcting plasma protein deficiencies and controlling the hemo dynamics (Fujiwara et al., 2018). The liver failure is often associated with poor metabolic control in cirrhosis patients, with regard to both glucose and amino acid metabolism. These metabolites are transported throughout the body with the help of Albumin and BCAAs provide important metabolites for gluconeogenesis and energy production. For patients with advanced cirrhosis, this combination approach may be useful to correct metabolic imbalance, optimize energy utilization and reduce catabolic stress (Tsien et al., 2018).

2. MATERIALS AND METHOD

This study was conducted in the patients with chronic liver cirrhosis of Allied hospital I Faisalabad. A structured clinical assessment form titled “Albumin & Aminoleban Therapy in Chronic Liver Cirrhosis: Distinct and Collective Influence on Liver Function Parameters” was used for data collection. Sample size was 40. It contained demographic data, medical history, treatment history, nutritional assessment, biochemical parameters (serum albumin, bilirubin and INR). Data on Intravenous Human Albumin Administration Therapy and Aminoleban Therapy was also gathered. Patient interviews, hospital records and laboratory investigations were used to assess the individual and combined therapeutic effects in chronic liver cirrhosis patients between the two treatments This study was carried out at Allied

Hospital I Faisalabad, using structured clinical assessment forms, patient medical record and laboratory investigations. The biochemical parameters such as serum albumin, INR, bilirubin and sodium were obtained from the standard hospital laboratory process. The data was organised and analysed statistically in a computer system running under Microsoft Windows with Microsoft Excel in graphical form.

Chronic liver cirrhosis patients were used to evaluate the effectiveness of Intravenous Human Albumin Administration Therapy and Aminoleban Therapy with biochemical and clinical parameters. Major evaluation measures were serum albumin, bilirubin, sodium and INR. These parameters were measured to evaluate the improvement of liver function and nutritional status. Rising levels of serum albumin and improvement of INR suggested improved liver synthetic function, whereas the fall of bilirubin suggested decreased liver damage and inflammation. In patients with chronic liver cirrhosis, these standard laboratory parameters could be used for reliable assessment of the individual and combined therapeutic effect of Albumin and Aminoleban therapy.

3. RESULTS

3.1 Effect of age and Gender on Liver parameters

This chart examines three important liver health indicators, Bilirubin, Albumin and INR (clotting time) in various age groups of men and women. In younger patients (< 50 years of age) these liver markers remain relatively stable and near normal. However, patients' liver function tests are much more problematic as they age. The changes that are most concerning occur in the oldest patient population (those over the age of 70). In this age group, men have a tremendous increase in bilirubin, which typically results in severe jaundice, and women have a dramatic increase in INR (lacking the proper proteins to clot properly).

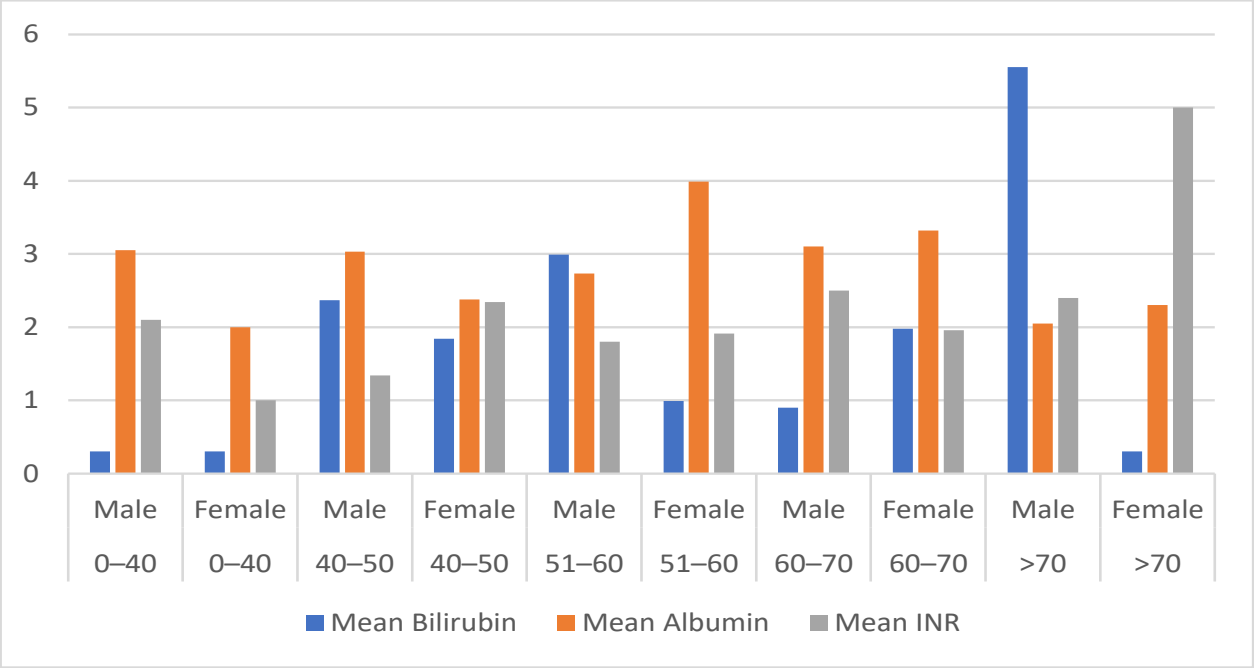

Figure 1: ***Effect of age and Gender on Liver parameters among Liver Cirrhosis Patients***

3.2 Effect of Albumin Therapy on Liver Parameters

This graph displays the trend of three vital liver parameters (Bilirubin in blue, Albumin in orange and INR in grey) over 13 patient observations during the course of albumin therapy. This treatment is usually to increase low blood protein levels while decreasing high bilirubin and clotting times (INR levels). For some samples, such as 4, 8, 10 and 11, this treatment achieves a high level of albumin, 5.0, successfully. If a child has high levels of albumin,

then the bilirubin is typically low, usually <1.0, indicating better liver function. But patients react differently and, in some cases, the result of treatment is still dangerous (patient 3 still has a high bilirubin) or is not as effective (patient 12's albumin level decreased, but his INR stayed high)

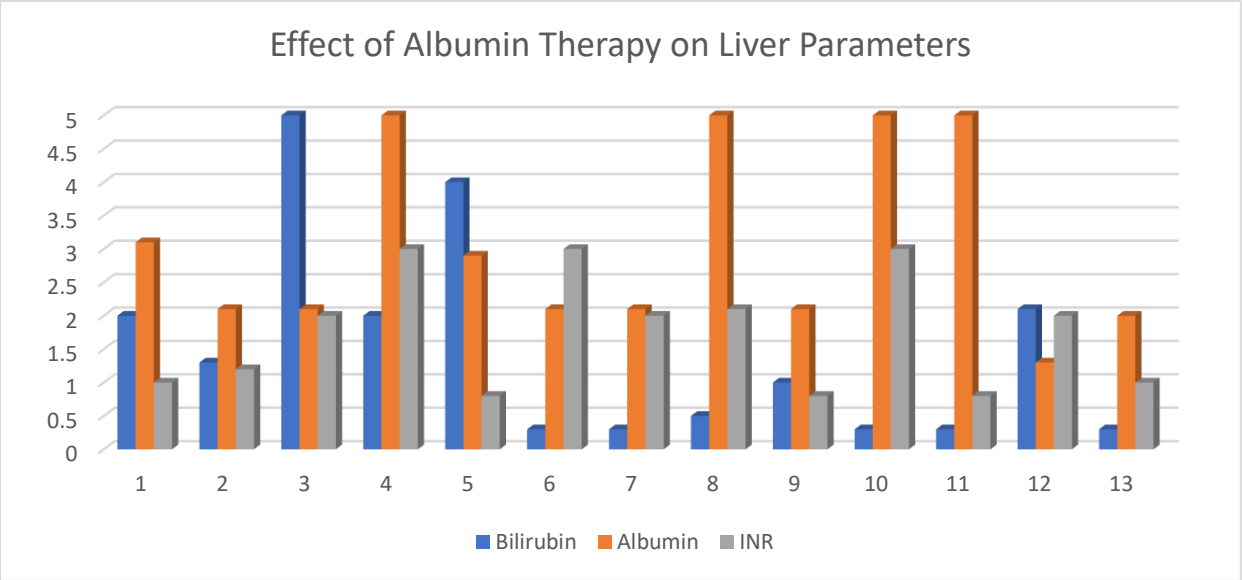

Figure 2: ***Effect of Albumin Therapy on Liver Parameters among Liver Cirrhosis Patients***

3.3 Effect of Aminoleban Therapy on Liver Parameters

The graph displays the effects of a special nutritional supplement (Aminoleban Therapy) on three liver markers (Bilirubin, Albumin and INR) over 13 patients. Aminoleban is an amino acid formula with a nutritive effect that facilitates liver function. In many patients, the treatment is very effective, such as numbers 4, 8, 10 and 11, and the level of healthy albumin protein reaches a high level of 5.0, while the level of harmful bilirubin protein remains low (less than 0.5). Some patients do not respond as well, however, with patient 3 retaining dangerously high levels of bilirubin at 5.0 and patient 12 with a poor response (low albumin, high INR – blood is still not clotting as it should).

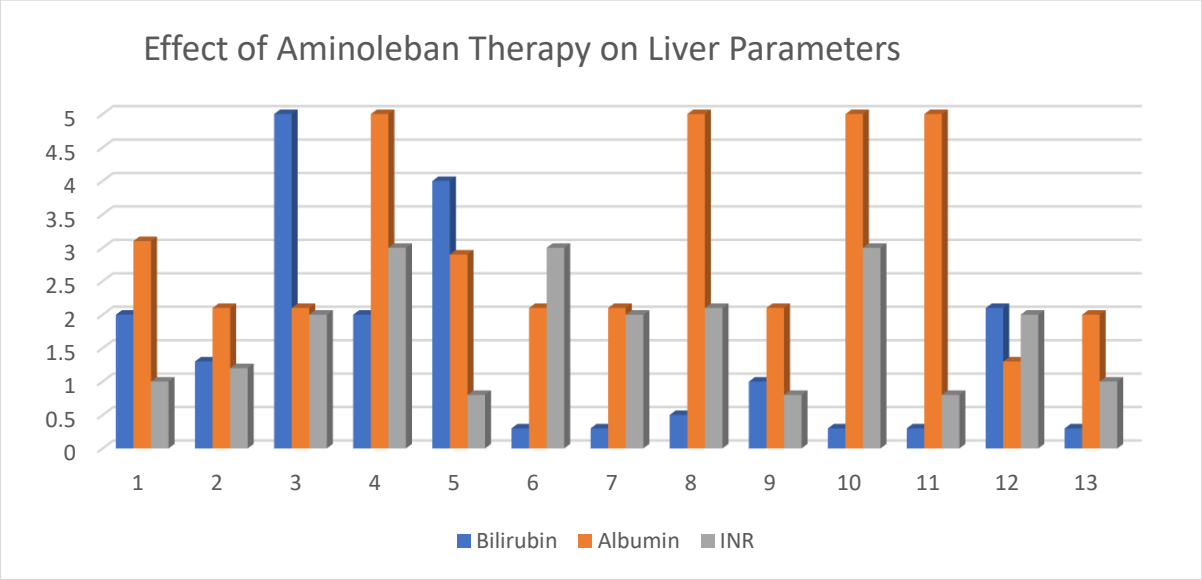

Figure 3: ***Effect of Aminoleban Therapy on Liver Parameters among Liver Cirrhosis Patients***

3.4 Effect of Albumin and Aminoleban Therapy on Liver Parameters

This graph displays the combined effect of Albumin and Aminoleban Therapy on three important liver markers, Bilirubin (blue), Albumin (orange) and INR (grey) on 14 patient cases. These two treatments are usually used together to get the most nutrition and liver stability. In many patients, including numbers 4, 8, 10 and 11, the combination is very successful and the healthy level of albumin is at the highest possible level of 5.0, with toxic bilirubin well below 0.5. Individual patients will still respond differently though, and patient 3 still has a dangerously high bilirubin spike on dual therapy, while patient 12 has poor results, with lowered albumin and high INR, so coagulation function is still impaired.

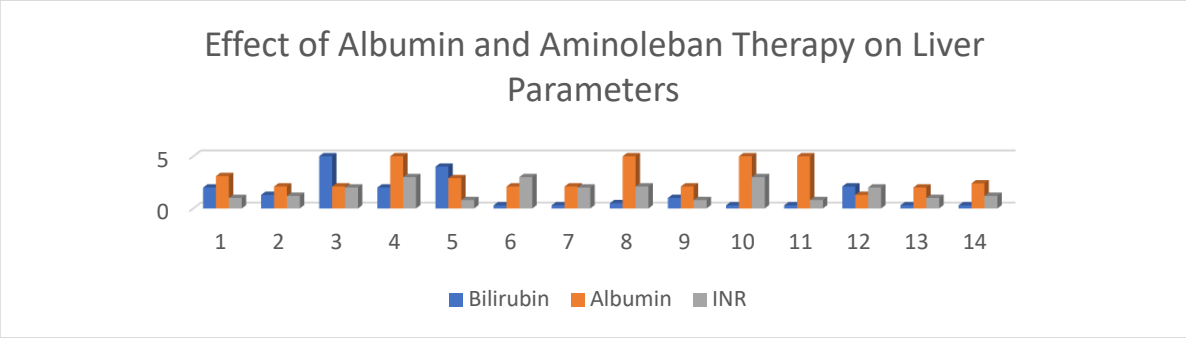

Figure 4: ***Effect of Albumin and Aminoleban Therapy on Liver Parameters among Liver Cirrhosis Patients***

3.5 Comparison between all Treatment Therapy Effect on Liver Parameter

This chart highlights the average scores for Bilirubin (blue), Albumin (orange) and INR (grey) to compare the success of the three types of treatments. The least desired results are obtained with albumin therapy alone, in which the average bilirubin is 2.7 and the average albumin is 2.56. The combination of Aminoleban therapy alone, however, is the most effective at improving nutrition, with an average value of albumin of 3.24. In conclusion, the dual treatment of both drugs allows the liver to recover better, with the lowest average (1.49) bilirubin, and with the blood clotting function at its healthiest level (1.64) INR.

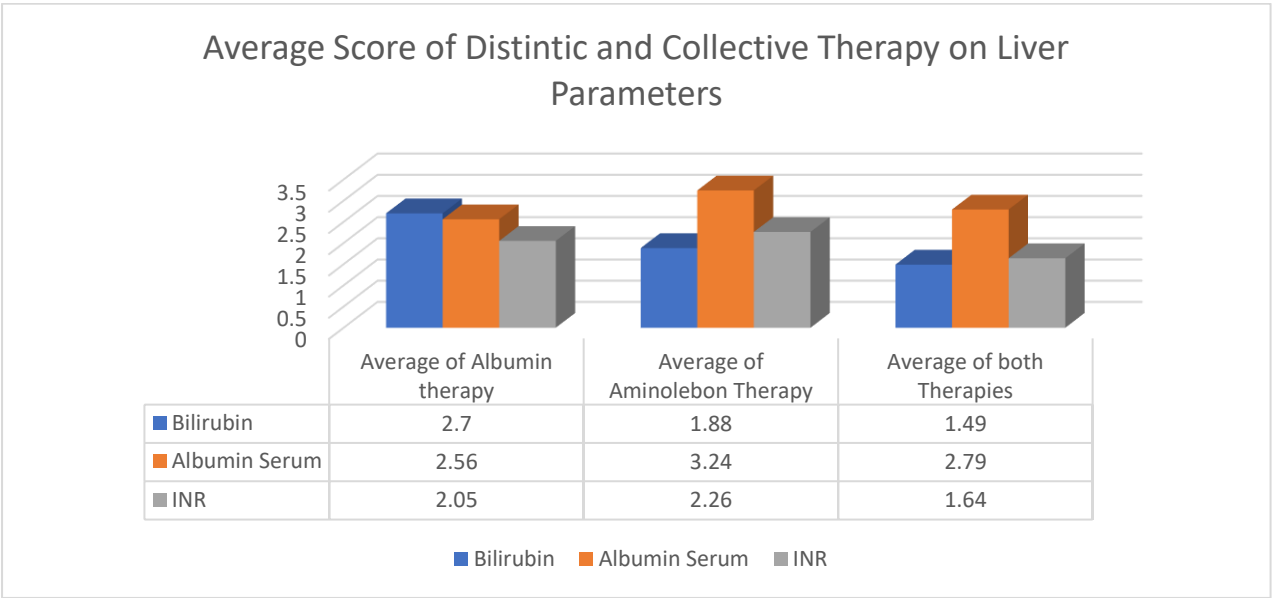

Figure 5: ***Comparison between all Treatment Therapy Effect on Liver Parameters among Liver Cirrhosis Patient***

4. DISCUSSION

In addition, age- related physiological changes in liver function may contribute to the increased vulnerability observed in this demographic group. With advancing age, hepatic blood inflow, regenerative capacity, and detoxification effectiveness gradationally decline, reducing the liver's capability to recover from habitual injury. This lowered hepatic reserve may accelerate the transition from compensated to decompensated cirrhosis in aged grown-ups, making complaint instantiations more clinically apparent during middle and late majority (Schmucker, 2021).

likewise, elevated INR in aged cirrhotic cases not only reflects disabled synthetic liver function but also indicates a broader imbalance in haemostasis, where both pro-coagulant and anti-coagulant pathways are disintegrated. This "rebalanced but fragile" coagulation state increases the threat of robotic bleeding as well as thrombotic complications, particularly in advanced cirrhosis. Age- related vascular fragility and comorbid conditions similar as hypertension or renal dysfunction may further complicate these haemostatic abnormalities (Tripodi & Mannucci, 2019).

Increased bilirubin situations in senior cases may be told by reduced hepatic transporter exertion and lowered biliary excretion effectiveness. Age- associated cholangiocyte dysfunction can vitiate corrosiveness inflow, leading to cholestasis and accumulation of poisonous metabolites in the rotation. This contributes not only to hostility but also to systemic complications similar as fatigue, pruritus, and worsening metabolic stress, which are generally associated with poor prognostic in end- stage liver complaint (Moreau et al., 2020).

The observed deterioration in coagulation and bilirubin biographies among cases progressed over 70 may also be explained by the concerted impact of age- related hepatic structural changes and reduced physiological reserve. With adding age, there's a progressive decline in hepatocyte function, reduced hepatic blood inflow, and lowered regenerative capacity, all of which contribute to disabled conflation of clotting factors and reduced bilirubin concurrence. These physiological changes make senior individualities more susceptible to rapid-fire decompensation when liver injury occurs, indeed in the presence of fairly stable habitual complaint (Schmucker & Bilir, 2021).

A study of individual treatment responses reveals that single-agent drugs can be beneficial, but can work very differently in different patients. Isolating Albumin therapy offers a rapid increase in blood volume, but it has a minimal effect on the underlying nutrient status of cells or on protein biosynthesis. Conversely, oral branched-chain amino acid (BCAA) granules such as Aminoleban directly target muscles which are the leading sites of albumin protein production, and stimulate the body's natural production of albumin (Tajiri & Shimizu, 2018).

However, and as shown in the data, single-agent therapies are inadequate in controlling severe rises in bilirubin or destabilisation of INR in highly unstable patients, and a multi-targeted approach is required. Finally, Albumin and Aminoleban therapy produced most favourable and balanced changes in all liver function tests. This combination of the combined volume and osmotic effect of IV albumin with the metabolic effect of BCAAs is effective at reducing high levels of toxic bilirubin and improving blood clotting times (INRs) to their healthiest ranges. Recent clinical trials have validated the concept that these therapies can be combined for truly comprehensive care: They stabilize blood vessels, reduce systemic inflammatory activity and provide the precise blood vessel-building blocks necessary to repair liver function and prevent life-threatening complications (Sideris et al., 2023).

5. CONCLUSION

The study ends up with a conclusion that both Albumin and Aminoleban shows significant positive effect on Liver Function parameter in Liver Cirrhosis patients. Albumin therapy was effective in increasing the serum albumin levels and in improving the serum albumin, ascites and complications of liver decompensation. The use of Aminoleban therapy led to improvement of nutritional status, hepatic protein synthesis, and hepatic encephalopathy through correction of amino acid imbalance. The combination of both therapies yielded better results than either therapy alone in terms of liver function and outcomes. Thus, albumin and Aminoleban

combination therapy could be a clinically beneficial supportive therapy to enhance the clinical condition, and quality of life in patients with chronic liver cirrhosis.

6. RECOMMANDATION

Looking However, the scope of this thesis opens the way to develop several potential research directions:

- Future studies need to expand this comparison to a vast number of patients, across several medical centres, in a randomized controlled design to confirm the effectiveness of the combined treatment in many different patients.
- A long-term study should be started to follow patients for more than 12–24 months to determine the effect of combined therapy on long-term mortality, readmission, and quality of life.
- Neurological outcomes should be directly assessed with respect to the collective treatment, and in particular the mechanism of the amino acid profile of Aminoleban in reducing blood ammonia to prevent hepatic encephalopathy.
- Academic and medical staffs should create detailed and straightforward nutrition guides and nutrition counselling tools to aid outpatients to safely maintain optimal protein intake at home after hospital discharge.

REFRENCES

Albillos, A., Lario, M., & Álvarez-Mon, M. (2022). Cirrhosis-associated immune dysfunction: Distinct features and clinical relevance. Journal of Hepatology, 76(4), 930–946.

Fleming, K. M., Aithal, G. P., Card, T. R., & West, J. (2021). The epidemiology and natural history of liver cirrhosis: A population-based study. Lancet Gastroenterology & Hepatology, 6(8), 621–632.

Fujiwara, K., Mochida, S., Matsui, O., Nakatsuka, T., & Oka, H. (2018). Long-term branched-chain amino acid supplementation improves survival and reduces hospitalizations in patients with advanced liver cirrhosis. Hepatology Research, 48(3), E211–E221.

Ismaiel, A., Bucsa, C., Farcas, A., & Leucuta, D. C. (2022). Nutritional interventions and branched-chain amino acids in liver cirrhosis with sarcopenia: A systematic review and meta-analysis. Nutrients, 14(16), 3342.

Moreau, R., Clària, J., Aguilar, F., Fenaille, F., Lozano, J. J., Trebicka, J., Jalan, R., & Arroyo, V. (2020). Blood metabolomics uncovers inflammation-associated mitochondrial dysfunction in patients with decompensated cirrhosis. Journal of Hepatology, 72(4), 688–696.

Oettl, K., & Stauber, R. E. (2021). Structural and functional alterations of human serum albumin in liver cirrhosis and their clinical relevance. International Journal of Molecular Sciences, 22(9), 4785.

Pinzani, M., Rosselli, M., & Zuckermann, M. (2021). Liver cirrhosis: From pathophysiology to novel clinical therapeutic strategies. Molecular Aspects of Medicine, 77, 100914.

Plauth, M., Bernal, W., Dasarathy, S., Merli, M., Prakoso, E., Sam, J., & Schütz, T. (2022). ESPEN guideline on clinical nutrition in liver disease. Clinical Nutrition, 41(1), 205–231.

Schmucker, D. L. (2021). Age-related changes in liver structure and function: Myths and realities. Biogerontology, 22(2), 135–149.

Schmucker, D. L., & Bilir, B. (2021). Hepatic sinusoidal endothelium and the hepatic reserve in the elderly: Implications for acute-on-chronic liver failure. Aging and Disease, 12(3), 784–796.

Sideris, G., Karageorgiou, V., & Thomas, N. M. (2023). Multi-targeted therapy in decompensated cirrhosis: Synergistic effects of intravenous albumin and branched-chain amino acids. World Journal of Gastroenterology, 29(14), 2115–2130.

Tajiri, K., & Shimizu, Y. (2018). Branched-chain amino acids in liver diseases: Translational research and clinical application. World Journal of Gastroenterology, 24(13), 1394–1405.

Tripodi, A., & Mannucci, P. M. (2019). The coagulopathy of chronic liver disease: Is the balance really fragile? Journal of Thrombosis and Haemostasis, 17(10), 1582–1591.

Tsien, C., Davuluri, G., Singh, D., & Dasarathy, S. (2018). Metabolic control of amino acid and glucose homeostasis in advanced cirrhosis: Role of albumin and branched-chain amino acids. Metabolic Brain Disease, 33(4), 1015–1027.