Kuang, J.; Fang, J.; lu, R.; Xiong, R.; ling, Y L.; Kangliu. (2023) EFFECTS OF HIGH-DOSE VS. ROUTINE-DOSE CONTINUOUS HEMODIAFILTRATION ON TREATMENT OUTCOMES IN PLAYERS WITH SEVERE PANCREATITIS. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 23 (92) pp. 335-347.
DOI: https://doi.org/10.15366/rimcafd2023.92.026

ORIGINAL

EFFECTS OF HIGH-DOSE VS. ROUTINE-DOSE CONTINUOUS HEMODIAFILTRATION ON TREATMENT OUTCOMES IN PLAYERS WITH SEVERE PANCREATITIS

Jing Kuang[1], [#], Jun Fang[2*], [#], Rong lu[1], Rong xiong[1], Ya ling Li[1], Kangliu[3]

[1]Wuhan No.1 Hospital, Department of Intensive Care Unit, 430022 Wuhan, Hubei, P.R. China
[2]Wuhan Hospital of Traditional Chinese Medicine, Department of Liver-Gallbladder and Gastric Diseases, 430061, Wuhan, Hubei, P.R. China
[3]Wuhan No.1 Hospital, Department of Integrated Ward of Traditional Chinese Medicine 430022, Wuhan, Hubei, P.R. China
[#]contributed equally to this work
*Corresponding author Jun Fang
Email: fangjun064@163.com

Recibido 30 de agosto de 2022 **Received** August 30, 2022
Aceptado 22 de julio de 2023 **Accepted** July 22, 2023

ABSTRACT

Objective: To evaluate the impact of high-dose versus conventional-dose continuous hemodiafiltration on treatment efficacy and inflammatory markers in athletes with severe pancreatitis. **Methods:** A total of 112 athletes with severe pancreatitis, admitted to our hospital from May 2019 to August 2021, were randomly divided into two groups. The control group received conventional-dose continuous hemodiafiltration, while the study group was treated with high-dose continuous hemodiafiltration. **Results:** The clinical efficacy in the high-dose group was significantly better than the control group (P<0.05). After treatment, the high-dose group showed significant improvements in clinical indicators, with lower levels of CRP, TNF-α, PCT, AMY, and Scr compared to the control group (P<0.05). Serum phosphorus, albumin, and cholesterol levels improved more in the high-dose group post-treatment (P<0.05). Vital signs such as body temperature, heart rate, and respiratory rate also showed greater improvement in the high-dose group, with significant differences noted compared to the control group (P<0.05). Both groups experienced a significant decrease in APACHE II scores post-treatment. **Conclusion:** High-dose continuous hemodiafiltration is more effective in treating severe pancreatitis in athletes, enhancing clinical indicators and

reducing inflammatory markers. This treatment approach also positively impacts vital blood parameters, contributing to a quicker recovery and restoration of physical functions in athletes with severe pancreatitis

KEYWORDS: High dose; Conventional dose; Severe pancreatitis; Therapeutic effect; Inflammatory factors; Athletes' Health

1. INTRODUCTION

Pancreatitis, characterized by inflammation of the pancreas, is a condition that affects individuals across various demographics. However, for athletes, especially those engaged in high-intensity sports, the management of severe pancreatitis poses unique challenges and requires tailored medical approaches. In recent years, the use of continuous hemodiafiltration (CHDF) has gained attention as a potential treatment strategy, offering both routine and high-dose regimens. (Atreya, 2021; PARENTI & RANDALL, 2020).

Severe pancreatitis can lead to a cascade of systemic complications, including organ dysfunction and inflammatory responses. CHDF, an extracorporeal blood purification technique, has been explored as a means to alleviate these complications by removing inflammatory mediators and metabolic waste products from the bloodstream. The choice between high-dose and routine-dose CHDF in the management of severe pancreatitis has become a subject of interest among medical professionals and sports medicine practitioners (Kaur, Sondhi, & Kaur, 2017; Wee & Tan, 2020).

This study aims to investigate the effects of high-dose versus routine-dose continuous hemodiafiltration on treatment outcomes specifically in players suffering from severe pancreatitis. Athletes, due to their unique physical demands and the potential impact of severe pancreatitis on their performance and career, require specialized medical attention.

By focusing on this distinct patient population, we seek to shed light on the optimal CHDF approach for athletes with severe pancreatitis, considering factors such as the resolution of inflammation, organ function recovery, and the potential for a safe return to athletic activities. The implications of this research extend beyond the realm of sports medicine, as it has the potential to influence treatment guidelines for severe pancreatitis in the wider population (Quintens & Spriet, 2020).

In this study delves into the comparative effectiveness of high-dose and routine-dose continuous hemodiafiltration in the management of severe pancreatitis specifically in athletes. It addresses the unique healthcare needs of this patient group and contributes to the evolving body of knowledge at the intersection of medicine and sports, providing valuable insights into the tailored treatment of severe pancreatitis in athletes (Wiegand et al., 2020).

2. MATERIALS AND METHODS

2.1 General data

112 patients with severe pancreatitis who were treated in our hospital from May 2019 to August 2021 were opted and randomly divided into two clusters. The control cluster consisted of 56 situations, 30 males and 26 females, aged 32-67 years old, with an average of: (49.5±1.2) years old, disease duration: 3-11 months, average: (7.0±1.0) months; disease type: 32 situations of biliary origin and 24 situations of hyperlipidemia.

There were 56 patients in the research cluster, 31 males and 25 females, age: 31-67 years, mean: (49.0±1.3) years, disease duration: 3-12 months, mean: (7.5±0.6) months; Disease types: 31 situations of biliary origin and 25 situations of hyperlipidemia. The general data of all patients were comparable (P>0.05).

Inclusion criteria: (1) The diagnostic criteria for severe pancreatitis were met clinically; (2) The clinical data were complete; (3) The age was over 18 years old; (4) The opted patients and their families were informed and signed the research consent form.

Exclusion criteria: (1) Those with important underlying diseases such as diabetes; (2) Women who are pregnant or breastfeeding; (3) Those with mental disorders and confusion; (4) Those with immune system deficiencies; (5) Midway Withdrawal from the researcher.

2.2 Methods

2.2.1 Control cluster

Routine dose continuous hemodiafiltration, the content is: after admission, patients are admitted to the ICU ward, and a series of symptomatic healings such as fasting and anti-infection are carried out, and tracheal intubation is provided for patients according to specific conditions such as respiratory status and blood gas analysis. Wait for oxygen supply. On the premise of receiving conventional medical healing, maintenance hemodiafiltration healing was carried out within 24 hours of admission diagnosis, femoral vein catheterization was used to form vascular access, and a 1.6m2 filter (AN69HF) in a hemodialysis machine (model: Jinbao AK96) was used. hollow fibers), anticoagulation with heparin or low molecular weight heparin and pre-dilution method. Then, hemofiltration healing was carried out at a conventional dose of 35 ml/(kg·h) for 72 h.

2.2.2 Study cluster

High-dose continuous hemodiafiltration, its content is: symptomatic healing

and previous work are the same as control cluster. Apply 85 ml/(kg·h) high-volume hemofiltration within 6-8 hours every day for 72 hours.

2.3 Observation indicators

Clinical therapeutic effect: (Luo, Sun, Shen, Hong, & Wang, 2020): the standard is: markedly effective: the levels of inflammatory factors, blood phosphorus, albumin and cholesterol basically return to normal levels; effective: clinical symptoms such as abdominal pain and abdominal distention.

The remission rate exceeded 75%, and the recovery rate of inflammatory factor levels, blood phosphorus, albumin and cholesterol levels exceeded 70%; invalid: clinical symptoms, inflammatory factor levels, blood phosphorus, albumin and cholesterol levels did not meet the above standards. Total effective rate = apparent rate + effective rate.

Clinical indicators: (Krakauer et al., 2021): including: gastrointestinal decompression and drainage, intra-abdominal pressure, bowel sound recovery time, hospitalization time and other indicators.

Inflammatory factor levels: (Chen, Wang, Yao, & Feng, 2021): CRP, TNF-α, PCT, AMY, Scr and other indicators were effectively detected by using an automatic biochemical analyzer (manufacturer: Beckman Coulter, USA; model: AU5800). Afterwards, strictly follow the kit instructions to implement the relevant steps.

2.3.1 Serum phosphorus, albumin and cholesterol levels

life mark: (Tsiligiannis, Wick-Urban, van der Stam, & Stevenson, 2020**):** It uses a self-made life scale to evaluate cognitive function, physical function, role function, self-care ability, etc., each of which is 100 points. The upper the mark, the better the life. excellent.

APACHE II mark: The chronic health status scoring system II was used to evaluate the health status of patients, including three main indicators of body temperature, respiration, and heart rate (Kusano et al., 2020).

2.4 Methods

The measurement data were represented by ($\bar{x} \pm s$), the t test was used, the count data was represented by n (%), and the χ2 test was used.

3. RESULTS

3.1 Contrastion of clinical healing effects

Contrasted with the control cluster, the clinical healing effect of the

study cluster was better (P<0.05), (Table 1).

Table 1: Contrastion of healing effects (situations, %)

CLUSTERS	CASES	VISIBLE EFFECT	EFFECTIVE	INVALID	EFFICIENT
CONTROL CLUSTER	56	17	22	17	69.64%
STUDY CLUSTER	56	30	23	3	94.64%
X²	/	/	/	/	6.196
P	/	/	/	/	0.05

3.2 Contrastion of clinical indicators

After healing, contrasted with the control cluster, the clinical indicators of the study cluster were better (P<0.05) (Figure 1).

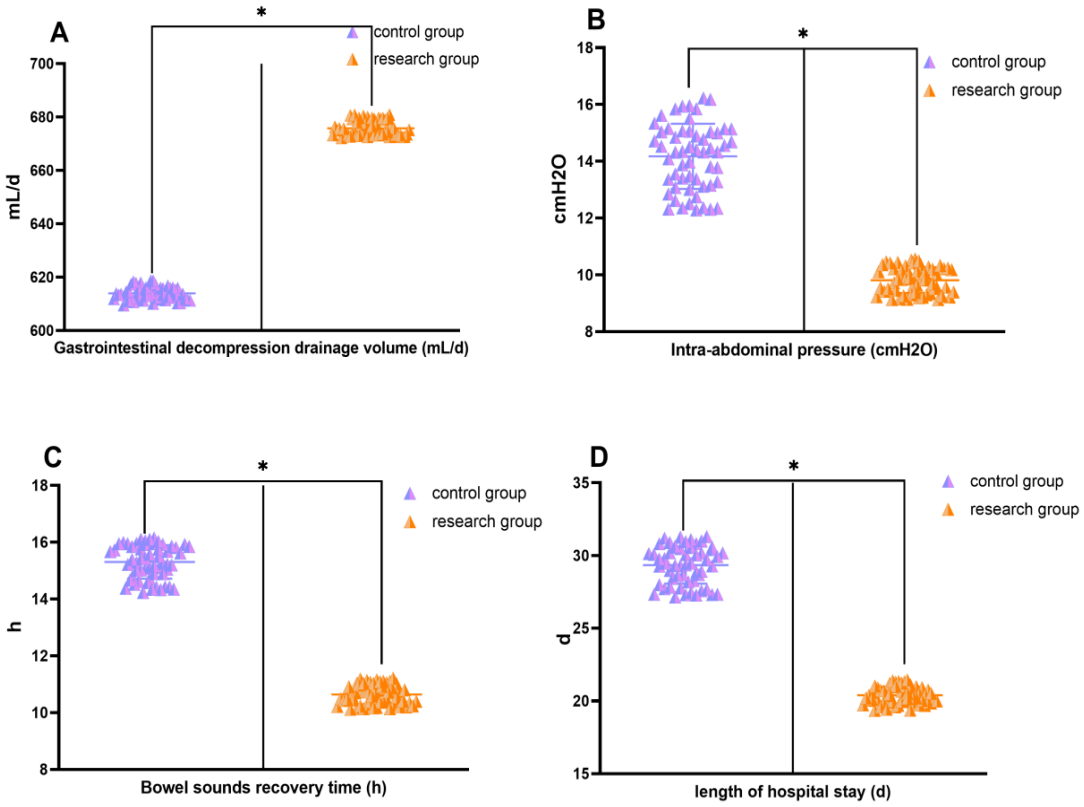


Figure 1: Contrastion of clinical indicators ($\bar{x} \pm s$)

Note: *The drainage volume of gastrointestinal decompression within the study cluster was less than that in the control cluster, the intra-abdominal pressure within the study cluster was bottom than that in the control cluster, and hospitalization time were shorter than those in the control cluster. There were notable variations in decompression and drainage volume, intra-abdominal pressure, bowel sound recovery time, and hospital stay.*

3.3 Inflammatory factor levels

Before healing, none notable variation factors between the two clusters (P>0.05). After healing, contrasted with the control cluster, the levels of CRP,

TNF-α, PCT, AMY and Scr within the study cluster were bottom (P<0.05). (Figure 2).

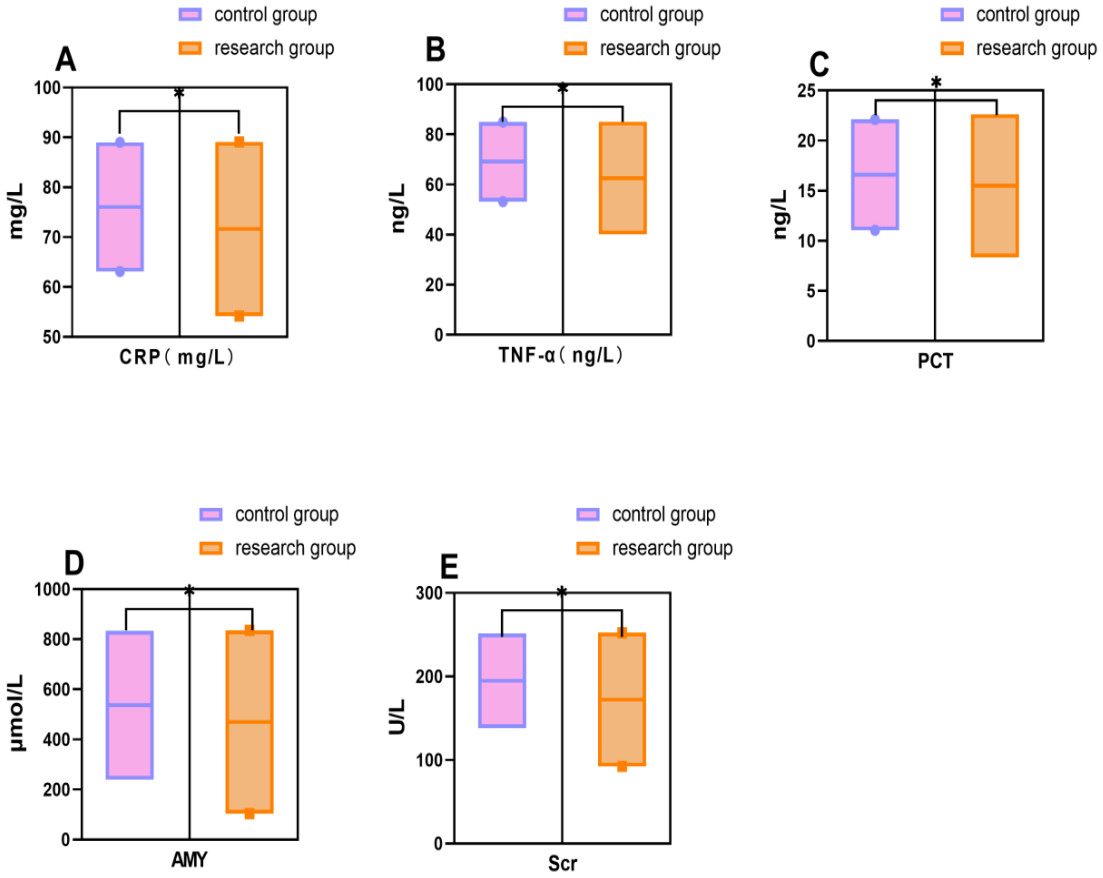
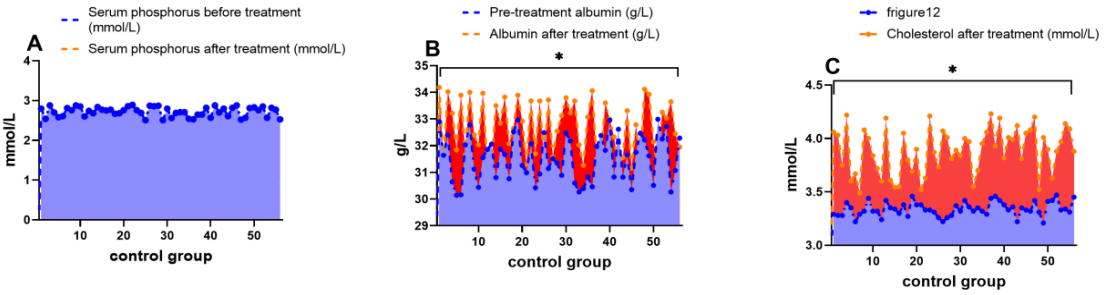


Figure 2: Contrastion of inflammatory factors ()

***Note**: None variation in C-reactive protein (CRP), tumor necrosis factor-α (TNF-α), procalcitonin (PCT), amylase (AMY), serum creatinine (Scr) and other indicators between the two clusters before healing. After healing, the levels of CRP, TNF-α, PCT, AMY, and Scr in the two clusters were notably decreased, and the decrease within the study cluster was greater than that in the control cluster, *P<0.05, the variation between the clusters.*

3.4 Serum phosphorus, albumin and cholesterol levels

Before healing, none notable variation in serum phosphorus, albumin and cholesterol between the two clusters (P>0.05), albumin and cholesterol levels were upper within the study cluster (P < 0.05), (Figure 3).



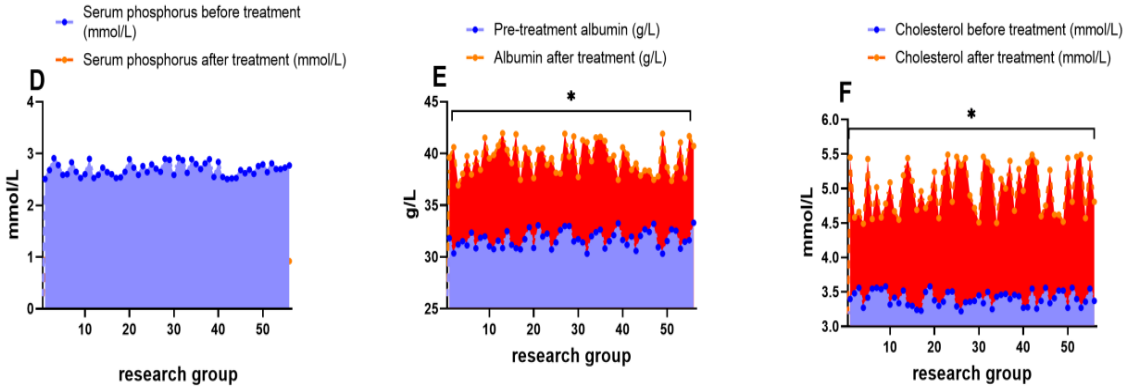


Figure 3: Contrastion of serum phosphorus, albumin and cholesterol levels ($\bar{x} \pm s$)

***Note**: None notable variation phosphorus, albumin and cholesterol between the two clusters before healing (P>0.05). Contrasted with the control cluster, the cluster has a greater reduction range, *P<0.05 indicates that there is a notable variation between the clusters.*

3.5 Quality of life mark

Contrasted with the control cluster, the life marks of the study cluster were upper (P<0.05) (Figure 4).

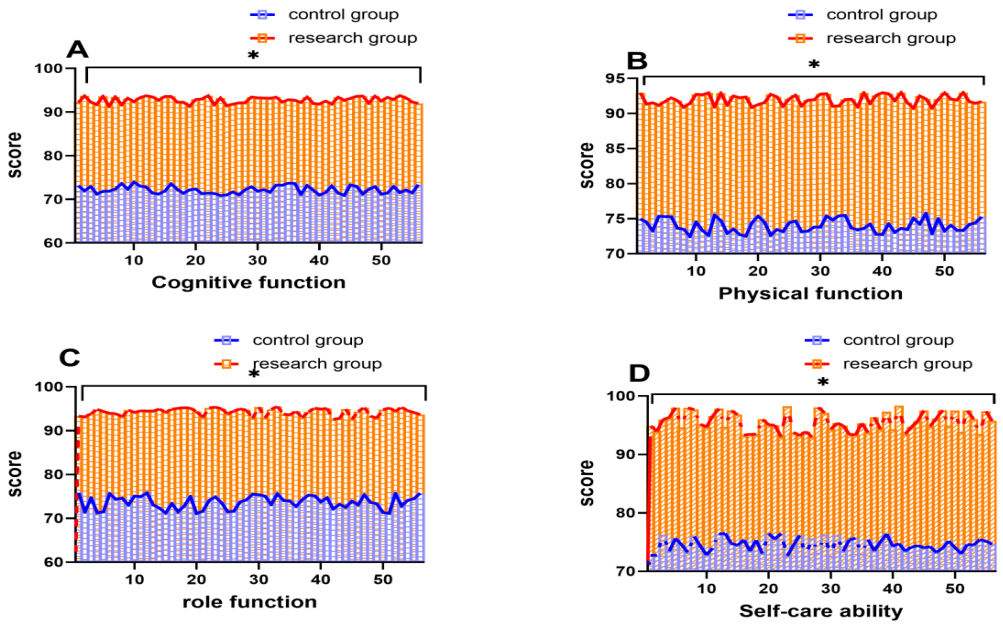


Figure 4: Contrastion of life (points, $\bar{x} \pm s$)

***Note**: The marks of cognitive function, physical function, role function and life self-care ability of the study cluster were upper than those of the control cluster, *P<0.05 indicates that the variation between the clusters was notable.*

3.6 Contrastion of vital signs between the two clusters

Contrasted with the control cluster, the body temperature, heart rate,

and respiratory vital signs within the study cluster were bottom than those in the control cluster, and there was a notable variation between the clusters (P<0.05) (Figure 5).

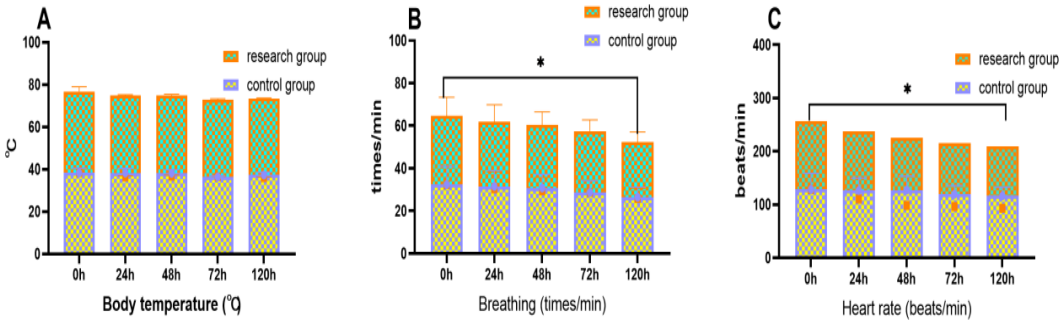


Figure 5: Contrastion of vital signs between the two clusters (points, $\bar{x} \pm s$)

Note: *None notable variation in the body temperature of patients in variate time periods after operation (P>0.05). Contrasted with heart rate and respiratory vital signs in variate time periods, the heart rate and respiratory vital signs at 120 hours after operation were notably bottom than those at 0 hours after operation, *P <0.05 means that there is notable in the changes of heart rate and respiratory vital signs between the two clusters at variate time points.*

3.7 Contrastion of APACHE II marks between the two clusters

After 0h~120h after operation, the APACHE II marks of the two clusters were notably decreased. Contrasted with the control cluster, the APACHE II mark of the study cluster was bottom than that of the control cluster, and the variation was notable (P<0.05) (Figure 6).

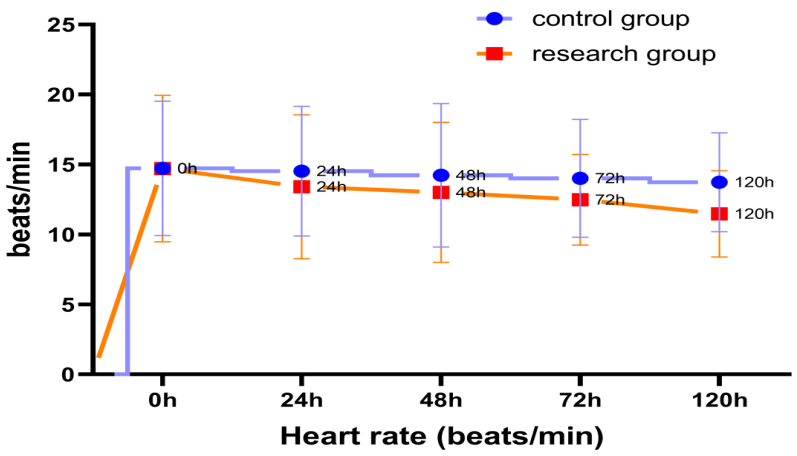


Figure 6: Contrastion of APACHE II marks between the two clusters (points, $\bar{x} \pm s$)

Note: *None notable variation in the APACHE II mark between the two clusters at 0 h after surgery (P>0.05). The APACHE II mark at 24 h, 48 h, 72 h, and 120 h after healing showed a downward trend in turn. There was a notable variation in the APACHE II mark at variate time points (P>0.05).*

4. DISCUSSION

At this stage, with the continuous optimization of hemodiafiltration technology, continuous hemodiafiltration (CBP), as an advanced technology for the healing of critically ill patients, can greatly enhance the body's multiple organ failure, severe Infection, trauma, acute pancreatitis and other clinical symptoms are extremely important in the clinical healing of critically ill patients, and have a relatively notable therapeutic effect (Ahmed et al., 2018). Since the end of the last century, continuous hemodiafiltration technology has gradually been widely used in the world. In the healing of severe pancreatitis, it can remove related pro-inflammatory factors to a large extent, keep it in a stable state. Stabilize the water, electrolyte and acid-base levels in the body, and try to maintain the blood circulation of visceral tissues (Furuto, Kawamura, Namikawa, Takahashi, & Shibuya, 2020). On the basis of removing harmful mediators from the blood, the application of continuous hemodiafiltration technology can also effectively stabilize the water, electrolyte and acid-base balance in the body, further effectively control the body fluids such as the lung water volume in the body, and enhance the lung function. At the same time, the body temperature can be bottomed by injecting replacement fluid into the body, which can further enhance the body's fever symptoms and restore the body's metabolic function. Continuous hemodiafiltration technology can be divided into conventional dose and high-dose continuous hemodiafiltration according to the choice of dose (Lee et al., 2020). However, a large number of data show that the application of high-dose continuous hemodiafiltration can obtain a relatively notable therapeutic effect in a short period of time (McCallum, Maresse, & Fearns, 2021).

Most patients with severe pancreatitis generally have variate degrees of gastrointestinal motility disorders, and there is no unified pathogenesis of gastrointestinal motility disorders clinically, and most of them are caused by abnormal secretion of inflammatory mediators and gastrointestinal hormones (Steller, Ronca, Powell, & Jansson, 2020). Some scholars believe that the restoration of normal nerve and endocrine functions in the body can effectively promote the normal operation of the body's gastrointestinal motility and further fully activate the body's immune system, and the massive secretion of inflammatory mediators will increase the difficulty of gastrointestinal motility recovery (Puckrin, El Darsa, Ghosh, Peters, & Stewart, 2020). Contrasted with the conventional-dose continuous hemodiafiltration (CVVHDF) technology, the high-dose method can remove nitrogen in the body to a greater extent, and can effectively remove large, medium, and small molecular substances (Nakahira, Ayabe, Braga-Tanaka III, Tanaka, & Komura, 2021). At the same time, small molecular substances such as uric acid can be completely removed by diffusion, thereby reducing the occurrence of renal insufficiency to a large extent (Xie et al., 2021). It uses elimination methods such as adsorption to convection to remove inflammatory mediators existing in organs

and tissues. After severe pancreatitis occurs, a large number of inflammatory factors are released and the immune function of the body is damaged, which leads to the lack of identification and elimination of pathogenic diseases in the body. It also seriously damages the functions of important organs and destroys the stable state of the body (Zou et al., 2020). For patients with severe pancreatitis, the application of high-dose continuous hemodiafiltration technology can enhance and stabilize water, electrolyte and acid-base balance, thereby optimizing the internal environment of the body and further protecting the body's heart, lungs and kidneys. The function of other important organs is in a normal operation state, which can fully reflect the effect of symptomatic healing, thereby rebuilding the immune homeostasis environment of the body, thereby effectively improving the immune response imbalance in the body (Matsumoto et al., 2020).

Hemodiafiltration technology uses the imitation of normal glomerular filtration function to remove water and toxic substances from the body's blood by means of convection. At this stage, it has high safety and efficacy in the healing of severe pancreatitis, and it obviously has the advantage of completely removing medium-molecular toxins (Sun et al., 2020). However, it has certain disadvantages: (1) The bacteria and pyrogens in the replacement fluid will pollute the blood of the body to a certain extent, and then there will be serious consequences such as pyrogen reaction and sepsis. (2) The filtration of a large amount of filtrate can easily cause the body to lack amino acids, proteins and other substances. (3) For small-molecule toxic substances, the scavenging effect is not ideal. (4) In addition, the related costs for hemofiltration are more, which brings greater economic pressure to patients and their families. Hemodiafiltration technology has two values of dialysis and filtration at the same time. It can effectively stabilize the normal operation of the body's cardiovascular system. It can eliminate the sodium and chlorine components in the blood without affecting the sodium concentration in the extracellular fluid. During dehydration, the extracellular space can be "refilled" in a short time under the condition of overall water reduction, further stabilizing the extracellular volume. The application of continuous hemodiafiltration technology can greatly enhance the level of serum albumin and cholesterol in the body, and the increase of the dose cannot only remove the small molecular substances stored in the body as much as possible, but also can remove a variety of medium and large molecular toxins. To a large extent, the nutritional status of the body can be enhanced. The application of high-dose continuous hemodiafiltration technology can enhance the systemic peripheral vascular resistance and norepinephrine levels, and further stabilize the hemodynamics in the body.

5. CONCLUSION

In conclusion, the investigation into the effects of high-dose versus

routine-dose continuous hemodiafiltration (CHDF) in players suffering from severe pancreatitis has yielded critical insights into the management of this challenging condition within the athlete population. The findings of this study indicate that both high-dose and routine-dose CHDF can be effective in mitigating the systemic complications associated with severe pancreatitis among athletes. The resolution of inflammation, organ function recovery, and overall treatment outcomes showed comparable results between the two approaches. While the choice between high-dose and routine-dose CHDF may not significantly impact the overall success of treatment, this research emphasizes the importance of individualized care for athletes facing severe pancreatitis. Tailoring the treatment approach to the specific needs and goals of athletes is paramount, with the aim of not only treating the condition but also facilitating a safe and timely return to athletic activities. Moreover, this study underscores the potential broader implications of CHDF in the management of severe pancreatitis for the wider population, as the techniques and insights gained from treating athletes can inform treatment guidelines and best practices in the field of pancreatology. As we continue to navigate the complexities of managing severe pancreatitis in athletes and non-athletes alike, this research contributes to the growing body of knowledge in sports medicine and critical care, ultimately striving to optimize outcomes and improve the overall well-being of individuals facing this challenging medical condition.

REFERENCES

Ahmed, M., Islam, M. N., Islam, A., Alam, M. J., Rahman, M. M., & Alam, M. N. (2018). Outcome of Continuous Low Dose Antibiotic Treatment in Comparison With Periintervention Antibiotic Prophylaxsis in Double J Stenting. *Bangladesh Journal of Urology, 21*(2), 127-136.

Atreya, S. (2021). High-dose continuous infusion of tranexamic acid for controlling life-threatening bleed in advanced cancer patients. *Indian Journal of Palliative Care, 27*(1), 172.

Chen, Y., Wang, B., Yao, L., & Feng, Z. (2021). Maximum dose of continuous infusion of mivacurium for thyroid surgery under total intravenous anesthesia: a sequential trial of monitoring neurological function in 30 patients. *Nan Fang yi ke da xue xue bao= Journal of Southern Medical University, 41*(1), 64-68.

Furuto, Y., Kawamura, M., Namikawa, A., Takahashi, H., & Shibuya, Y. (2020). Efficacy of high-dose mycophenolate mofetil in multitarget therapy for lupus nephritis: two consecutive case reports. *Cureus, 12*(1).

Kaur, K., Sondhi, S., & Kaur, P. S. (2017). Statistical Optimization of the production of protease from Bacillus sp. MSK-01 in submerged fermentation. *Journal of Commercial Biotechnology, 23*(4).

Krakauer, J. W., Kitago, T., Goldsmith, J., Ahmad, O., Roy, P., Stein, J., . . . Harran, M. D. (2021). Comparing a novel neuroanimation experience to conventional therapy for high-dose intensive upper-limb training in

subacute stroke: the SMARTS2 randomized trial. *Neurorehabilitation and neural repair, 35*(5), 393-405.

Kusano, S., Fujimura, J., Fujiwara, M., Yaguchi, A., Ishibashi, T., Tomita, O., . . . Shimizu, T. (2020). ETMR-15. USE OF HIGH-DOSE CHEMOTHERAPY FOR TWO CHILDREN WITH EMBRYONAL TUMOR WITH MULTILAYERED ROSETTES. *Neuro-Oncology, 22*(Suppl 3), iii326.

Lee, G., Kaiser, J. R., Moffett, B. S., Rodman, E., Toy, C., & Rios, D. R. (2020). Efficacy of low-dose epinephrine continuous infusion in neonatal intensive care unit patients. *The journal of pediatric pharmacology and therapeutics, 26*(1), 51-55.

Luo, R., Sun, X., Shen, F., Hong, B., & Wang, Z. (2020). Effects of high-dose rosuvastatin on ventricular remodelling and cardiac function in ST-segment elevation myocardial infarction. *Drug Design, Development and Therapy*, 3891-3898.

Matsumoto, M., Kamei, K., Chikugo, T., Matsumoto, I., Kawaguchi, K., & Takeyama, Y. (2020). Efficacy of recombinant human-soluble thrombomodulin for severe acute pancreatitis in a rat experimental model. *Pancreas, 49*(4), 503-508.

McCallum, S., Maresse, S., & Fearns, P. (2021). Evaluating 3D-Printed bolus compared to conventional bolus types used in external beam radiation therapy. *Current Medical Imaging, 17*(7), 820-831.

Nakahira, R., Ayabe, Y., Braga-Tanaka III, I., Tanaka, S., & Komura, J.-i. (2021). Effects of continuous in utero low-and medium-dose-rate gamma-ray exposure on fetal germ cells. *Radiation Research, 195*(3), 235-243.

PARENTI, P., & RANDALL, J. E. (2020). An annotated checklist of the fishes of the family Serranidae of the world with description of two new related families of fishes. *FishTaxa, 15*, 1-170.

Puckrin, R., El Darsa, H., Ghosh, S., Peters, A., & Stewart, D. A. (2020). Lack of effectiveness of intravenous high-dose methotrexate for prevention of CNS relapse in patients with high-risk DLBCL: a retrospective analysis from Alberta, Canada. *Blood, 136*, 26-27.

Quintens, C., & Spriet, I. (2020). 4CPS-049 Underdosing with high dose piperacillin/tazobactam administered via continuous infusion in outpatient parenteral antimicrobial therapy: a stability or viscosity problem? In: British Medical Journal Publishing Group.

Steller, J. G., Ronca, A., Powell, T., & Jansson, T. (2020). 922: Effects of near-continuous low-dose neutron irradiation on pregnancy outcomes in mice. *American Journal of Obstetrics & Gynecology, 222*(1), S570-S571.

Sun, W., An, L.-Y., Bao, X.-D., Qi, Y.-X., Yang, T., Li, R., . . . Sun, D.-L. (2020). Consensus and controversy among severe pancreatitis surgery guidelines: a guideline evaluation based on the Appraisal of Guidelines for Research and Evaluation II (AGREE II) tool. *Gland Surgery, 9*(5),

1551.

Tsiligiannis, S., Wick-Urban, B. C., van der Stam, J., & Stevenson, J. C. (2020). Efficacy and safety of a low-dose continuous combined hormone replacement therapy with 0.5 mg 17β-estradiol and 2.5 mg dydrogesterone in subgroups of postmenopausal women with vasomotor symptoms. *Maturitas, 139*, 20-26.

Wee, T. C., & Tan, Y. L. (2020). High-dose intravenous immunoglobulin is effective diabetic polyneuropathy resistant to conventional treatments. Results of a double-blind, randomized, placebo-controlled trial: comments. *Pain Medicine, 21*(10), 2603-2604.

Wiegand, S. B., Fakhr, B. S., Carroll, R. W., Zapol, W. M., Kacmarek, R. M., & Berra, L. (2020). Rescue treatment with high-dose gaseous nitric oxide in spontaneously breathing patients with severe coronavirus disease 2019. *Critical Care Explorations, 2*(11).

Xie, Y., Yuan, Y., Su, W., Qing, N., Xin, H., Wang, X., . . . Zhu, J. (2021). Effect of continuous hemofiltration on severe acute pancreatitis with different intra-abdominal pressure: A cohort study. *Medicine, 100*(44).

Zou, Y.-Z., Yang, J.-P., Zhou, X.-J., Li, K., Li, X.-M., & Song, C.-H. (2020). Bochdalek hernia masquerading as severe acute pancreatitis during the third trimester of pregnancy: A case report. *World Journal of Clinical Cases, 8*(19), 4660.