Vol 01 | Issue 07|2020

Critical Rounds

MICRO LABS LIMITED

Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring "CRITICONNECT" containing latest information in the field of Critical care medicine.

Inside This Issue

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Ltd

Lungpacer Gets FDA Emergency Use Authorization for COVID-19

Lungpacer Medical, headquartered in Vancouver, Canada, reported that its Diaphragm Pacing Therapy (DPT) device has been given FDA Emergency Use Authorization for use of weaning off ventilators for COVID-19 patients.

Patients with sustained mechanical ventilation may undergo atrophy of the diaphragm disuse and diaphragmatic dysfunction (VIDD) caused by the ventilator, which makes it more difficult for patients to breathe alone and increases the time needed for ventilation. To avoid or reverse VIDD, the Lungpacer DPT Device is planned.

The Lungpacer DPT device uses a temporary multi-electrode catheter (LIVE catheter) to activate the phrenic nerves controling the diaphragm electrically. The catheter has an additional pulse generator attached to it. The LIVE catheter resembles a conventional central venous catheter that is implanted into the left subclavian vein where its connection to the phrenic nerves enables the nerves to be activated by electrical impulses and the diaphragm strengthens.

For patients at high risk of weaning failure, which requires those needing artificial ventilation due to COVID-19 or other high-risk disorders such as post-cardiac and post-thoracic surgical operations, Lungpacer Medical's DPT Program can also be utilized according to the FDA.

In a statement, Lungpacer CEO Doug Evans said that this awesome award offers a rare opportunity to support other people impacted by this global health epidemic enhance their results.

Outcomes and Clinical course of novel coronavirus, SARS-CoV-2 patients, discharged from two hospitals in Wuhan

INTRODUCTION

A novel coronavirus, known as the extreme acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was reported in late 2019 as the source of COVID-19 in Wuhan, a town in China's Hubei province. Full-genome sequencing and phylogenic research revealed that SARSCoV-2 in the same subgenus as the SARS virus is a betacoronavirus, albeit in a separate clade.

At the stage of the entire genome, SARS-CoV-2 is 96 per cent similar to a bat coronavirus, indicating bats are the primary vector. Initial epidemiological investigations found that COVID-19 was related to access to the Wuhan seafood market which also marketed live rabbits, rats, and other products. Subsequently the primary mechanism of transmission was human-to-human communication among near contacts. The disease has spread rapidly all over the world, with more than 410,000 cases of COVID-19 recorded. In other countries COVID-19 outbreak has been registered, primarily among Wuhan travelers and their contacts. WHO proclaimed the epidemic to be a pandemic.

COVID-19 is believed to have an incubation time of up to 14 days after exposure. COVID-19's major presentation characteristics include fatigue, cough, dyspnea, and chest imaging bilateral infiltrates. Around 20% of cases lead to multi-organ impairment (including cardiac collapse, septic shock, severe heart attack, or acute kidney collapse). But a full description of COVID-19's clinical route has not been fully defined. There is no particular cure for COVID-19 except for infection prevention and supportive counseling. Single organ intervention rehabilitation is the foundation of COVID-19 care in adults with serious disease. Early identification of mortality risk factors can be helpful in recognizing those that would require vital treatment early on. A research has been undertaken appropriately to monitor the therapeutic treatment over the entire duration of the disease. An examination of the risk factor has been performed to identify significant clinical characteristics consistent with bad outcomes.

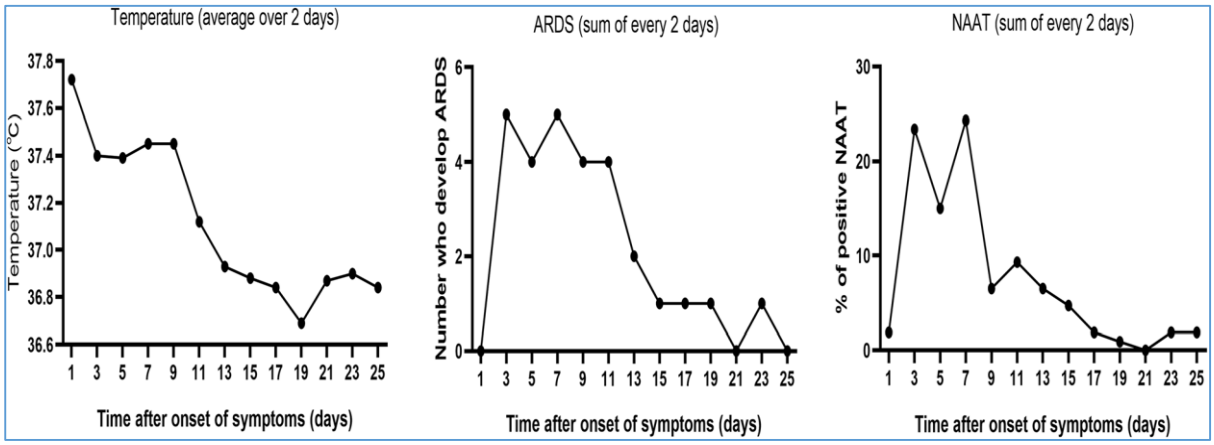
METHODS

Retrospective case series of COVID-19 patients from Zhongnan Hospital of Wuhan University in Wuhan and Xishui Hospital, Hubei Province, China. Epidemiological, demographic, and clinical data were collected. The clinical course of survivors and non-survivors were compared. Risk factors for death were analyzed.

RESULTS

A total of 107 discharged patients with COVID-19 were enrolled. The clinical course of COVID-19 presented as a tri-phasic pattern. Week 1 after illness onset was characterized by fever, cough, dyspnea, lymphopenia, and radiological multi-lobar pulmonary infiltrates. In severe cases, thrombocytopenia, acute kidney injury, acute myocardial injury, and adult respiratory distress syndrome were observed. During week 2, in mild cases, fever, cough, and systemic symptoms began to resolve and platelet count rose to normal range, but lymphopenia persisted. In severe cases,

leukocytosis, neutrophilia, and deteriorating multi-organ dysfunction were dominant. By week 3, mild cases had clinically resolved except for lymphopenia. However, severe cases showed persistent lymphopenia, severe acute respiratory dyspnea syndrome, refractory shock, anuric acute kidney injury, coagulopathy, thrombocytopenia, and death. Older age and male sex were independent risk factors for poor outcome of the illness.



Temporal clinical profiles in 107 patients with COVID-19. % of positive NAAT: percentage of patients who showed positive NAAT for the first time

CONCLUSIONS

This study reveals a period of 7–13 days after the onset of illness as the critical stage in the COVID-19 course. Age and male gender seems to be independent risk factors for death of COVID-19.

REFERENCES

Wang D, Yin Y, Hu C, et al. Clinical course and outcome of 107 patients infected with the novel coronavirus, SARS-CoV-2, discharged from two hospitals in Wuhan, China. Crit Care 2020;24(188).

A Prospective Double-Blind Study to evaluate the Cardioprotective Effects of Propofol & Dexmedetomidine in Open-Heart Surgery

INTRODUCTION

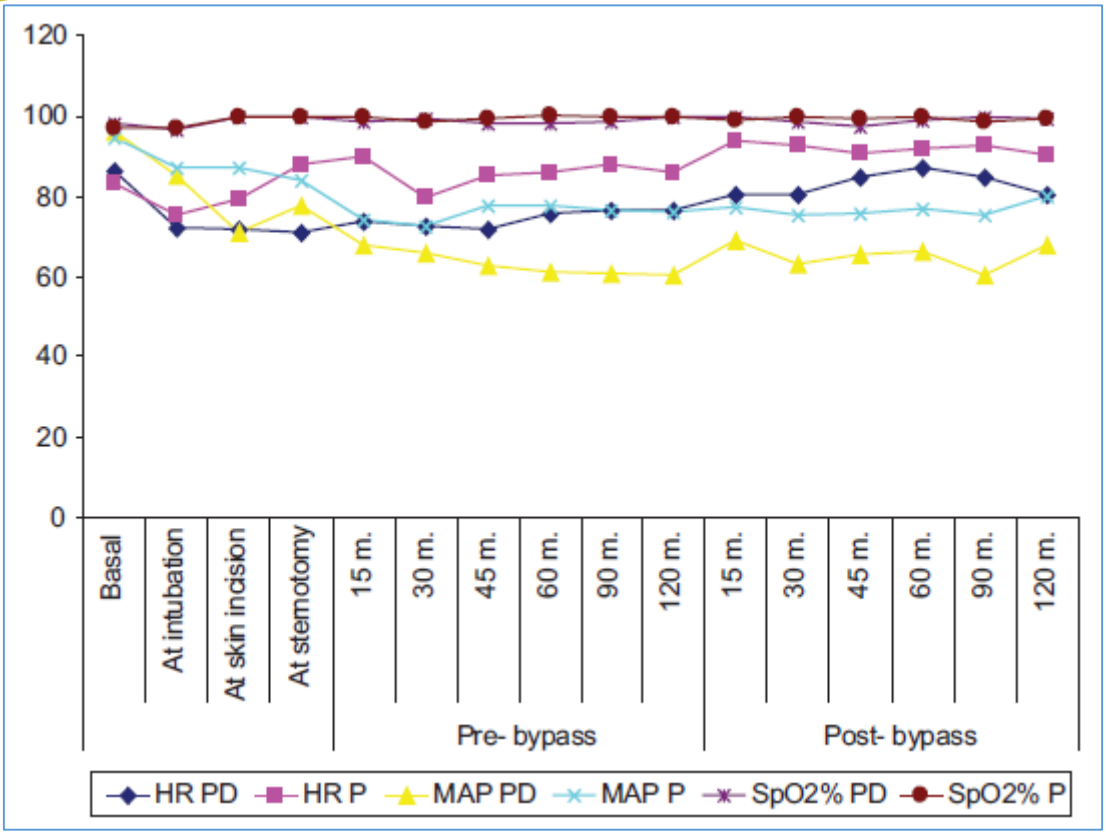
Myocardial safety in cardiac surgery is a necessity which includes perioperative multimodal strategies to decrease which avoid elevated demand for and intake of myocardial oxygen, contributing to postoperative heart problems including myocardial ischemia, instability and heart failure. This study aims to study the effect of propofol-dexmedetomidine continuous infusion cardioprotection during open-heart surgery in adult patients.

METHODS

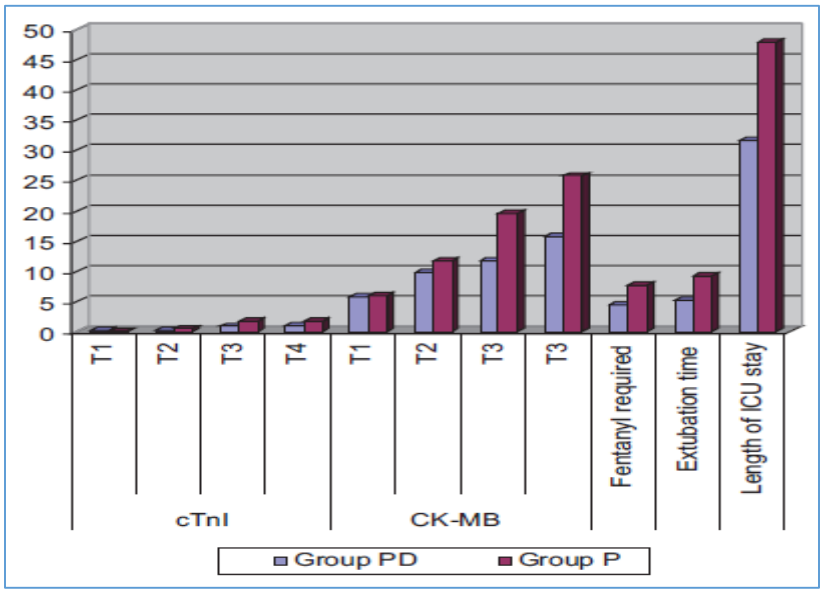
Sixty adult patients of both sexes aged from 30 to 60 years old belonging to the American Society of Anesthesiologists III or IV undergoing open-heart surgery were randomly divided into two equal groups: Group P (control group) received continuous infusion of propofol at a rate of 2 mg/kg/h and 50 cc 0.9% sodium chloride solution infused at a rate of 0.4 µg/kg/h (used as a placebo) and Group PD received continuous infusion of propofol at a rate of 2 mg/kg/h and dexmedetomidine 200 µg diluted in 50 cc 0.9% sodium chloride solution infused at a rate of 0.4 µg/kg/h. Infusion for all patients started immediately preoperative till skin closure. Hemodynamic measurements of heart rate (HR), invasive mean arterial pressure, and oxygen saturation were recorded at baseline before induction of anesthesia, immediately after intubation, at skin incision, at sternotomy and every 15 min in the 1st h then every 30 min during the prebypass period then every 15 min in the 1st h then every 30 min after weaning from CPB till the end of the surgery. Serum biomarkers; cardiac troponin (cTnI) and creatine kinase-myocardial bound (CK-MB) samples were measured basally (T1), 15 min after unclamping of the aorta (T2), immediate postoperative (T3), and 24 h postoperative (T4). Intraoperative data were also recorded including the number of coronary grafts, aortic cross-clamping duration, duration of cardiopulmonary bypass (CPB), duration of surgery, and rhythm of reperfusion. Fentanyl requirement, extubation time, and length of intensive care unit (ICU) stay were also recorded for every case.

RESULTS

There was no statistically significant differences as regard to demographic data between the studied two groups. HR and blood pressure recorded was lower in the PD group than the control group, and this difference was noted to be statistically significant. Furthermore, the PD group showed lower levels of myocardial enzymes (cTnI and CK-MB), decreased total fentanyl requirement, earlier postoperative extubation, and shorter ICU stay than the *P* (control) group.



Heart rate and invasive mean arterial blood pressure and oxygen saturation percent of the studied groups. Data are presented as mean ± standard deviation Group P: Propofol group; Group PD: Propofol dexmedetomidine group



Cardiac troponin enzyme, creatine kinase-myocardial bound, fentanyl requirements, extubation time and length of intensive care unit stay of the studied groups. Data are presented as mean ± standard deviation. Group P: Propofol group; Group PD: Propofol dexmedetomidine group. (T1): basally; (T2): 15 min after unclamping of the aorta; (T3): Immediate postoperative; (T4): 24 h' postoperative

CONCLUSIONS

From this study results, it can be concluded that the use of propofol-dexmedetomidine in CPB surgeries offers more cardioprotective effect than propofol alone as detected by lower levels of cardiac enzymes, stable hemodynamics, less fentanyl requirements, earlier postoperative extubation, and shorter ICU stay.

REFERENCES

Elgebaly AS, Fathy SM, Sallam AA, Elbarbary Y. Cardioprotective effects of propofol-dexmedetomidine in open-heart surgery: A prospective double-blind study. Ann Card Anaesth 2020;23:134-41.