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Management strategies for the burn ward during COVID-19 pandemic

Ning Li a, Tingmin Liu a, Hualing Chen a, Jianmei Liao b,**, Haisheng Li a, Qizhi Luo a, Huapei Song a, Fei Xiang a, Jianglin Tan a, Junyi Zhou a, Gaozhong Hu a, Zhiqiang Yuan a, Yizhi Peng a, Gaoxing Luo a,*

a Institute of Burn Research, State Key Laboratory of Trauma, Burns and Combined Injury, Southwest Hospital, Army Medical University (Third Military Medical University), Chongqing 400038, China
b Department of Nursing, Southwest Hospital, Army Medical University (Third Military Medical University), Chongqing 400038, China

ABSTRACT

COVID-19 pandemic is sweeping the globe. Any outpatient or new inpatient especial in burn department during the pandemic should be as a potential infectious source of COVID-19. It is very important to manage the patients and wards carefully and correctly to prevent epidemic of the virus in burn centers. This paper provides some strategies regarding management of burn ward during the epidemic of COVID-19 or other respiratory infectious diseases.

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* Corresponding author at: Institute of Burn Research, State Key Laboratory of Trauma, Burns and Combined Injury, Southwest Hospital, Army Medical University (Third Military Medical University), Chongqing 400038, China.
** Corresponding author at: Department of Nursing, Southwest Hospital, Army Medical University (Third Military Medical University), Chongqing 400038, China.

E-mail addresses: jianmeiliao@163.com (J. Liao), logxw@yahoo.com (G. Luo).
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Any outpatient or new inpatient special in burn department during the pandemic should be as a potential infectious source of COVID-19, which could lead epidemic in burn ward by transmission from person to person. Hence, it is particularly important to organize management strategies for burn ward during the pandemic of Covid-19. This paper establishes some management strategies for burn ward based on our own experience and the Chinese national and international public health issues regarding ward management as well as the specific characteristics of the burn ward during the respiratory infectious diseases [1,2].

1. Management strategies of the administrational system in burn ward

1.1 Establish and strengthen the managing team of epidemic prevention and control in each ward

The new coronavirus infection is a major public health emergency, and each ward responds to the emergency under the guidance of the hospital emergency response system and the superior administrative agency in combination with its own features [3]. Based on the model of the ward’s infection control team, the ward director and the head of nurse are responsible for the epidemic prevention and control team, the composition includes the medical chief in hospital, the nursing group leader, the clinical and laboratory infection control specialist, and the microbiology team. Each clinical diagnosis, nursing and recovery procedures will be conducted under the guidance of Chinese National Health Commission regarding Covid-19 prevention and management along with class A nosocomial infection requirements.

1.2 Reinforce the training of all medical staffs in the ward

In order to train medical staff in an effective way, our ward establishes related knowledge and basic methods in prevention and control of Covid-19. Each one should complete online theory learning styles, and update basis knowledge learning on a regular basis firstly. The clinical skills such as hand hygiene, wearing masks, goggles, protective face screen should be learned on line through video and practice repeatedly. After that, each staff should pass the theory knowledge test on line and the practical operation test to ensure all medical staff to deal with any situation proficiently.

2. Management strategies of the ward environment

2.1 Environmental layout of the ward

2.1.1 Environmental control of burn building

The management of access control shall be strengthened, and the visitors shall be suspended. In special cases, visitors shall be monitored for temperature and screened for epidemiological history before entrance.

2.2 Adjustment of ward layout

Our clinical diagnosis and treatment units includes burn intensive care unit, ordinary wards, rehabilitation center, wound treatment center, scar treatment center, the operating room, outpatient emergency, etc. Some adjustments were made based on the diagnosis and treatment procedures with the features of the architecture.

The outpatient part, emergency part, ordinary ward and BICU are divided into clean area, potential polluted area and polluted area respectively. Signs and instructive lines among three different zones should be clear and obvious.

The emergency part in the ward was set up as a separate area for emergency treatment and admission of new patients. All new inpatients including pediatric burns will be isolated in a single room of the ward for 14 days without leaving the ward. Meanwhile, the severe burn patients should be admitted to BICU, who should be managed as a suspect of COVID-19 following the instruction of infectious disease specialists. After the new inpatients stay in the ward for more than 14 days excluded the suspicion, the patients can be collected together and put into the ordinary ward.

Public areas in the ward such as rehabilitation center, wound repair center and scar treatment center are only provided for patients who have been hospitalized for more than 14 days. New patients and emergency patients are treated
in the ward accordingly and avoid any unnecessary prompt management.

2.2.1. Strict disinfection system
Each staff needs to comply with strict hand hygiene to improve disinfection prevention. The ward is sterilized and ventilated with the circulating air sterilizer 3 times a day, more than 30 min for each time. The wards avoid central air conditioning due to safety reasons, use infrared burn treatment equipment for patients to keep warm and maintain good natural ventilation. 1000 mg/L chlorine-containing disinfectant or 75% alcohol are chosen for table disinfection, wipe or soak disinfection method is confirmed. The ground will use 1000 mg/L chlorine-containing disinfectant to wipe or spray disinfection from the outside to indoor, not less than 30 min for each time. Disinfection of public air should be done without people on sight, acid peroxide and hydrogen peroxide will be used for ultra-low capacity spray disinfection, and the disinfection frequency was also 3 times a day [5–7].

3. Management strategies of the personnel in burn ward

3.1. Patient management

3.1.1. Management of inpatients and caregivers for burns

3.1.1.1. Education of epidemic prevention knowledge for burns. Each ward should to the new patients and their caregivers should be given basic education of epidemic prevention knowledge in each ward. It is required that no any visitors from outside can enter into the ward and the caregivers are not allowed to leave the ward. The food delivery system will deliver daily groceries and food to each individual.

3.1.1.2. Management of the caregivers for burns. Only one caregiver in the ward is allowed to accompany each adult patient, two for pediatric patient. Temperature and registration will be conducted to each caregiver. Basically, caregivers are not allowed to go out of their rooms expect certain special conditions. In case that caregivers should go out from their rooms, the security and the nurses should be informed firstly and they should perform hand hygiene, face hygiene when they come back to their room. No visitors are allowed during the outbreak. Our ward delivers fully consistent remote video
for visitors to reduce the emotional impact and minimize the risk of potential infection within family members [8–13].

3.1.1.3. Monitoring of vital signs of burn patients. Staff should monitor body temperature, respiratory rhythm, frequency and depth, and blood oxygen saturation of the patients and their caregivers. At the same time, the consciousness and systemic symptoms, such as systemic muscle pain, fatigue, loss of appetite, etc., should be observed and recorded. Importantly, the respiratory symptoms including cough, sputum cough, chest tightness, dyspnea and cyanosis should be paid much attention to. For patients with assisted ventilation, parameters such as inspiratory pressure, expiratory pressure, oxygen concentration and others should be adjusted according to the doctor’s advice.

3.1.2. Management of newly admitted burn patients
According to the national new diagnosis criteria treatment of infection scheme (version 5) of COVID-19, the patient should be screened by clinical symptoms and epidemiological history. For the suspected or confirmed patients, the operations should be followed the consultation of infectious disease experts in time to prevent further possible transmission. For the suspected patients, it is recommend to accept lung CT scan and routine blood tests. If it is necessary, the confirmed patients should be transferred to the infection department as soon as possible.

3.1.3. Management of the recovered burn patients
The outpatients are not encouraged to back the ward for only rehabilitation treatment, they can get consultation and instruction by using website, Wechat APP, even phone on line. In addition, each patient check-in online everyday and they can share his status and improvement of rehabilitation which reinforces the encouragement among patients. If the recovered patients need to readmit to the ward due to disease condition, they can be allowed to see their doctor and evaluated through outpatient appointment system with the related preventive measures.

3.1.4. Management of the burn patients needing dressing change
Mild burn victims always need dressing change regularly. The patients are recommended to do that in nearby clinics avoiding the usage of public transportation. The wound management team should follow up the patients’ wound repair on a regular basis. For patients who really need to come to the hospital, the medical staff and the patients should follow the instruction and regulation avoiding virus transmission.

3.2. Management of the medical staff in burn ward

3.2.1. Health management of the medical staff in burn ward
The staffs are recommended not to take public transportation as far as possible. Everyone should monitor and report his health status day including fever, cough, shortness of breath and other abnormal conditions. If he has any symptoms or signs related with COVID-19, he should report to the epidemic prevention and control team as soon as possible. Meanwhile, personal contact history was reported based on epidemiological history. The staff with possible infection should be in home quarantine strictly, and consult or see the fever clinic as required. The staff in each ward should be assayed and record body temperatures twice a day with noncontact detector. Meanwhile, the detail of the staff’s transportation between his home and the ward should be recorded. According to the situation of patients in ward, flexible scheduling for the staffs should be implemented, which requires who should stay at home and who should work in the ward to reduce maximally the risk of transmission. All the personnel who went out of the city after January 23 will be quarantined at home for 14 days. Those who contacted with persons from Hu Bei province since January 1 will be required home quarantine. Meanwhile, each ward should strengthen the arrangements for emergency personnel, interns and trainees.

3.2.2. Requirement for protecting the medical personnel in burn ward
In accordance with the national protection plan [3], the layered protection method is adopted for medical personnel. The medical staff in the ordinary outpatient, emergency and ward of burns shall adopt primary protection. Secondary and tertiary protection should be applied for the staffs who contact with the suspected or confirmed cases.

3.2.3. Management of medical operation and disposal of burns
Researches demonstrated that endotracheal intubation, tracheotomy, mechanical ventilation and fiberoptic bronchoscopy increase the transmission risk of SARS-CoV and MERS-CoV [14]. According to the “medical institutions in suspected novel coronavirus infection prevention and control of provisional guidelines” announced by WHO [15], medical staffs who perform tracheal intubation, tracheotomy, intubation, airway lavage, and bronchoscopy microscopic lavage operation need to act with double preventive standards which including hand hygiene, personal protective equipment use, respiratory health, precautionary needle stab wounds, the cleanliness of medical supplies and medical waste treatment, etc. The suspected or confirmed cases of Covid-19 should apply droplet isolation and contact isolation, moreover, air isolation is also necessary for medical operations producing aerosols.

In the management of specimen collection, according to the doctor’s advice and under the implementation of standard preventive measures, correct collection of patients’ respiratory secretions, blood specimens, wound specimens, etc. Each time the staff should work with the microbiology group for specimens collection, transferring and others.

4. Management strategies of surgery for burns

4.1. Management of the selective surgery for burns
We recommend stopping the selective surgery of burns before COVID-19 is excluded completely. Only the necessary operation of the suspected or confirmed patients which may threat life or influence the prognosis significantly could be perform with the secondary and tertiary protection. OR staff could not
be allowed to enter the ward and can stay in the lobby to handover the patients before or after the operation.

4.2. Management of the emergent surgery for burns

For the patients who need urgent surgery, the necessary check including blood routine test, lung CT scan and others should be done firstly. For the suspected or confirmed cases, ward should comply with strict emergency proposal to deal with the patient and be fully prepared in the perioperative period to prevent the transmission of the disease. Infection specialists should be consulted for the treatment plan for the suspected or confirmed patients, if necessary they should be transferred to the infection department for further treatment [16–19].

5. Management strategies of the protective supplies in burn ward

In case of the shortage of protection and disinfection supplies, it is necessary for each ward to establish a registration and management system for obtaining and using various protection and disinfection materials. The usage should be calculated in store room every day. The staffs require to use the supply effectively.

6. Management strategies of the diet for burns

The burn inpatients should be supply with high-calorie, high-protein, high -vitamin, digestible diet and be encouraged to drink adequate amounts of water each day. Meanwhile, the patients are not allowed to order delivery food from outside unless the restaurant is authorized.

7. Management strategies of the mental health for the isolated burn inpatients and the quarantined medical staff

Patients isolated are prone to be fear, anxiety, anger, lonely with sleep disorders and other problems, especial the critical patients who can not be visited by family members with face to face in a certain period. Therefore, it is necessary to correctly assess the psychological state and needs of patients. According to the patients’ emotional reactions and behavioral changes, intervention measures such as psychological adjustment were given to the patients. Medical staff also needs to supply the patients more emotional support and accurate information to reduce mental problems.

On the other hand, supporting strategies should be set up for the quarantined medical staff. The isolated staff at home should be given greeting and concerning to help them mental health. Summarily, it is important to have a regulation to manage the burn ward to prevent and control the transmission of COVID-19. The strategies should include administrative management, environmental management, personnel management, and management of surgery, protective supplies, mental health and others.

Conflicts of interest

None.

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