



Prevention and Control Measures and Effects of COVID-19 in Shenmu City Hospital, China

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Authors' contributions

This work was carried out in collaboration among all authors. Author LY designed the study. Authors GK and LH performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors WQ and QZ managed the analyses of the study. Author JF managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Purpose: To explore the prevention and control strategies and effects of COVID-19 in Shenmu City Hospital, so as to provide basis for the prevention and control of COVID-19 in Shenmu City.

Methods: Retrospective analysis and review of our hospital after the outbreak of COVID-19 prevention and control program, response measures and management procedures and other aspects of the deployment.

Results: In the 86 days up to April 15, 2020, there were 7,843 pre-diagnosis and triage patients, among which 707 were high-risk group, 3,140 were general population and 3,996 were key population. 992 patients were treated in COVID-19 clinics, 2 suspected cases were reported and 89 were kept under observation. 5, 351 visits in general fever clinics; 89 cases were hospitalized in isolation ward, including 2 suspected cases. COVID-19 was discharged after improvement.

Conclusion: Initial progress has been made in epidemic prevention and control. COVID-19 has not been reported in the whole city. It shows that effective prevention and control strategies are of great significance for achieving the goal of "three zeros" (zero infection, zero spread and zero death), and are worth learning and promoting.

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1. INTRODUCTION

In December 2019, a new pneumonia broke out in Wuhan, Hubei Province, China. On February 8, 2020, the National Health Commission named this emerging epidemic Novel coronavirus pneumonia(NCP) [1]. Before that, The World Health Organization (WHO) named the novel coronavirus causing NCP as 2019-nCoV, and WHO also suggested naming the pneumonia infected by novel Coronavirus as "2019-nCoV acute respiratory disease" [2]. On February 11, the coronavirus Research group of the International Committee on Classification of Viruses published a paper on novel Coronavirus named on medRxiv, a release platform for medical preprint, formally naming the novel Coronavirus AS SARS-Cov-2 [3]. On January 20, 2020, the National Health Commission classified it into Class B infectious diseases and managed it according to Class A infectious diseases [4]. On 31 January, WHO Director-General Tan Desai declared that COVID-19 was a "Public health emergency of international concern" (PHEIC) [5]. The disease is highly contagious and has a high mortality rate [6]. By April 20, 2020, 31 provinces, autonomous regions, municipalities directly under the Central Government and Xin Jiang Production and Construction Corps had reported 82,758 confirmed cases, 4,632 deaths and 37 suspected cases [7].

Since the outbreak of coVID-19, Medical personnel in China have been fully prepared to fight the coVID-19 epidemic in this region and in our hospital. As the main force fighting against the epidemic, the hospital is responsible for the treatment and life care of patients. With more opportunities to have close contact with patients, the hospital is most likely to be infected with the disease. If infection occurs, the safety and medical quality of personnel in the medical institution will be seriously affected. Therefore, in order to do a good job in the prevention and control of virus infection from novel Coronavirus, we should do "early discovery, early report, early diagnosis, early isolation and early treatment", so as to control the spread of epidemic disease, reduce the infection rate of patients and ensure zero infection of medical staff.

As the only designated hospital of Novel Coronavirus infection in Shenmu city, Shenmu City Hospital is also one of the first

designated hospitals of novel Coronavirus infection prevention and treatment in Shaanxi Province. It is incumbent upon us to do a good job in epidemic prevention and control. The achievements of Shenmu Hospital in epidemic prevention and control are as follows:

2. METHODOLOGY

Study and implement the spirit of the latest guideline documents of "Novel Coronavirus Infection Prevention and Control Technical Guide for Medical Institutions" [8] and "Guidelines on the Scope of Common Medical Protective Devices in The Prevention of Pneumonia Infected with Coronavirus (Trial)" [9]. Approved by the ethics Committee of our hospital, combined with the actual situation of our hospital's treatment work, retrospective analysis method was used to summarize and summarize the early response strategies and measures implemented by the hospital after the outbreak of the epidemic.

3. THE PREVENTION AND CONTROL MEASURES

3.1 The Organization Construction

Shenmu City Hospital is the designated hospital of CoVID-19 in Shenmu city. Since the outbreak of COVID-19, the hospital has actively established a leading team for epidemic prevention and control, with the President as the chief commander, and Medical Department, hospital awareness office, nursing department, protection department and other 15 departments as a team member. Eight special teams have been deployed, namely, the COVID-19 Prevention and Control Office, the clinical Medical treatment team, the preliminary triage team, the fever clinic team, the ambulance transport team, the infection control team, the material supply and logistics team, and the information team. Each group has clear responsibilities and gradually implements prevention and control work.

3.2 The System Construction

Based on the actual situation of the hospital, a simple, clear, convenient and streamlined COVID-19 epidemic prevention and control system should be established, which is the core

of the hospital's sustainable work. Hospitals have issued 《 Diagnosis and treatment scheme of novel coronavirus pneumonia in Shenmu City Hospital》, 《Shenmu hospital on the prevention and control of pneumonia novel coronavirus in children and pregnant women》, 《Work system of outpatient service for common patients with fever》, 《Notice of Shenmu City Hospital on the management of patients in general wards during the epidemic period (trial)》, 《Notice of Shenmu City Hospital on further improving the management of general outpatient, emergency and inpatient during the epidemic period》, 《 Notice on ward rounds management of new coronavirus cases in Shenmu City Hospital》, 《 On the notification of fever treatment and drug purchase for the staff who returned to YU Lin during the "third return" period for epidemic prevention and control》, 《Shenmu hospital on novel coronavirus prevention and control of self-inspection》, 《Guidelines for fever outpatients》, 《Notification of inpatients and their families》 etc.

3.3 Materials Reserves

Material preparation, focusing on the storage of drugs, testing reagents and medical protective equipment. According to the prevention and treatment plan of our hospital, the drugs should be stored according to the number of isolated beds for one week. Our hospital take the lead in the detection of COVID-19 IgM and IgG antibodies in the fever clinic. The hospital stores supplies through various channels, including masks, latex gloves, protective clothing, goggles, protective face screens and other medical protective equipment.

3.4 Personnel Training

During the epidemic prevention and control period, personnel training was carried out in medical administration, hospital management, nursing, disease control and other departments, involving multi-level and multi-angle training. The hospital carried out a total of 11 times of large-scale joint training, and 26 times of small-scale key special training. After the training, the hospital passed the assessment and supervised the implementation.

3.5 The Prevention and Control Process

3.5.1 Screening and initial screening

Standardize the treatment process, screening and screening full coverage. Only the only

access channel is reserved in the hospital. All the people who come to the hospital will have their body temperature checked, ask about their epidemiological history, and promote the screening management of shaanxi health code.

3.5.2 Preview triage

Effective triage of the population, high-risk and key patients do not miss. The pre-examination triage office shall set up general pre-examination triage and pre-examination triage in the epidemic area, fill in the 《Shenmu hospital Inquiry form for COVID-19》, and gradually modify and improve the contents. All the people who came from Wuhan and the surrounding case reporting areas for tourism and residence or who had been exposed to COVID-19 cases were managed as high-risk groups, and the doctors conducted triage again at the pre-examination triage office (Fig. 1). The flow chart of Shenmu City Hospital was designed (Fig. 2).

3.5.3 Fever clinic

General fever clinic and new crown fever clinic were established. After pre-examination and triage, patients with common fever without respiratory symptoms and signs of COVID-19 and epidemiological history were instructed to wear surgical masks in the outpatient department of common fever. Patients with a history of epidemiology in Wuhan and epidemic areas, accompanied by or without respiratory symptoms, who were at high risk were treated for fever in the new crown. A clinical observation ward was set up in the new coronavirus fever clinic to independently carry out DR, blood routine, new coronavirus IgM antibody detection, and nasal and pharyngeal swab collection and examination.

3.5.4 Isolation ward

Standardize the management of isolation wards. Through process reengineering, the isolation ward realizes the three-level hospital sense management standard to ensure the process is reasonable and avoid cross-infection. Single rooms for suspected cases shall be strictly implemented, and hospitalization management shall be conducted for confirmed cases between two people.

3.5.5 Standby ward

The number of beds in the isolation ward is limited. In order to achieve the management goal

of "all receivables", the hospital will renovate the 12-floor surgical building, with 12 floors as the clean area, 12 floors to 11 floors as the buffer zone, 11 floors as the disease area, 11 floors to 10 floors as the semi-contaminated area, and 10 floors as the clean area. According to the number of patients, the number of floors and beds in the standby ward was increased, and the patients with negative nucleic acid test twice in the isolation ward were mainly admitted and treated.

3.5.6 Follow-up and home isolation

People who had a history of being free from the epidemic area and had no fever and no clinical symptoms were required to be quarantined at home for 14 days, and their body temperature was monitored twice a day. The outpatient and discharge cases of covid-19 fever were followed up and registered daily.

4. PREVENTION AND CONTROL RESULTS

As of April 15, 2020, a total of 228 people had participated in the epidemic prevention and control, including 59 doctors, 108 nurses and 61 others (including logistics staff). Every morning, the expert team conducted remote consultation for a total of 41 times. After 86 days of epidemic prevention and control, no confirmed cases were detected in Shenmu City Hospital, and the epidemic prevention and control achieved initial results.

4.1 Preview Triage

There were 7843 pre-test triage patients, including 707 high-risk patients, 3140 general patients and 3996 key patients.

4.2 Fever Clinic

There were 992 outpatient received for COVID-19 fever, 2 suspected cases were reported, and 89 cases were observed. There were 5,351 outpatient received for general fever.

4.3 Isolation Ward

There were 89 cases hospitalized in the isolation ward, including 2 suspected cases and 89 COVID-19 cases excluded. Among them, 12 special cases were detected in the new coronavirus ward, including 1 case of lung tumor, 1 case of huge retroperitoneal tumor, 1 case of epidemic hemorrhagic fever, 1 case of viral encephalitis, 4 cases of severe interstitial pneumonia and 3 cases of tuberculosis, and they were treated actively.

4.4 Standby Ward

The admission of 45 patients with COVID-19 was excluded. After diagnosis and treatment, all patients with pneumonia improved and were discharged from the hospital.

4.5 Follow-up

The outpatient visits of 1503 patients with COVID-19 fever and 280 patients with positive COVID-19 were followed up.



Fig. 1. Shenmu city hospital preview triage of COVID-19
(Photo taken by Li Rui from Publicity Department of Shenmu City Hospital)

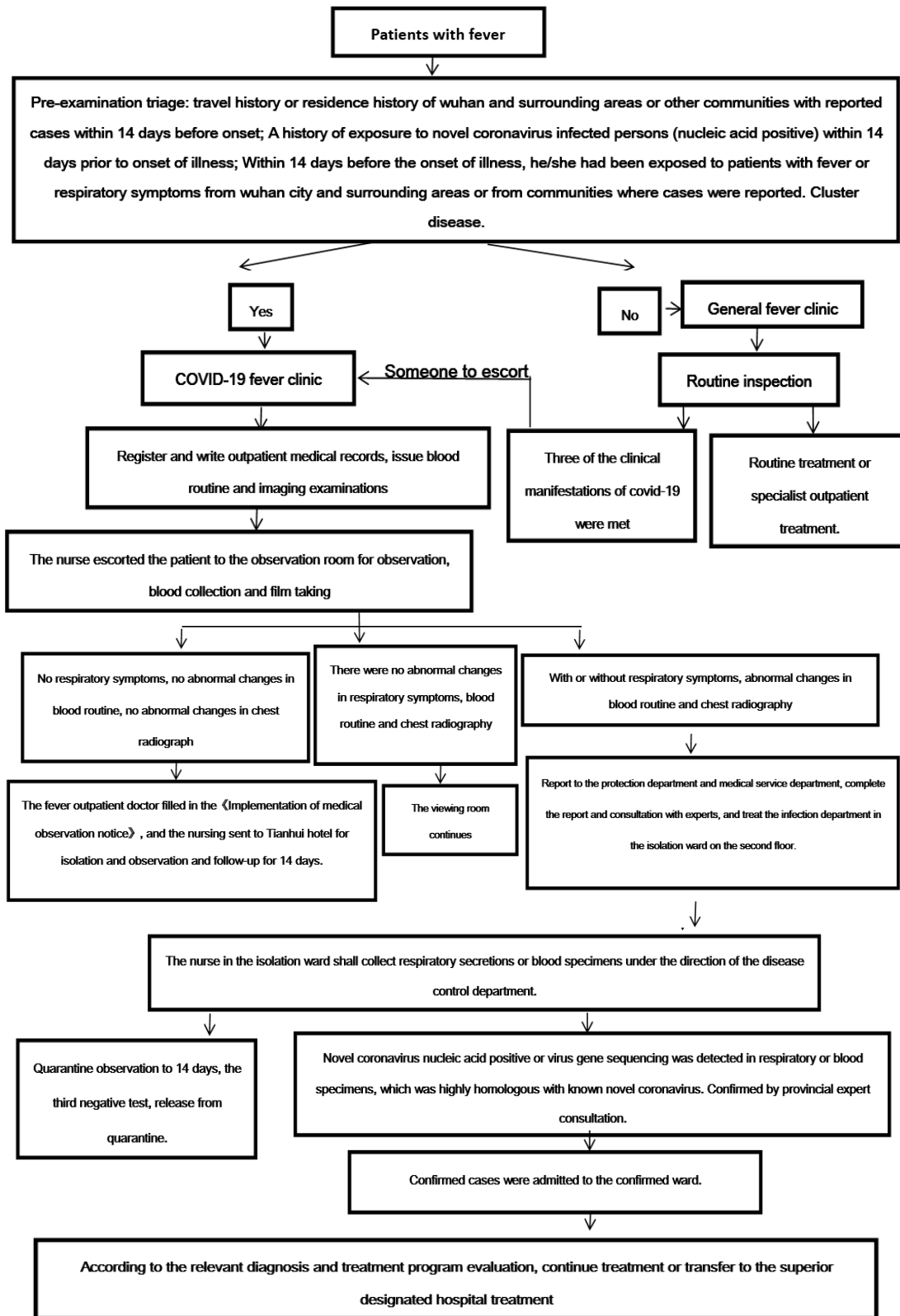


Fig. 2. Shenmu city hospital treatment procedures for patients with fever

5. DISCUSSION

Globally, the COVID-19 epidemic is still not optimistic, and the number of confirmed cases has not shown an easing trend, with the total number of confirmed cases exceeding 4.51 million [10]. At present, COVID-19 is under effective control in China, with the daily number of confirmed cases not exceeding double digits. Hubei and Wuhan regions have been cleared of COVID-19, which also demonstrates China's successful prevention and control strategies and results.

At present, the main task of prevention and control is to "prevent the importation from outside and prevent the rebound from inside". Imported cases of partial than indigenous cases, report input cases since 1578 [11], 31 provinces gradually restore to return to work and production at the same time, continue to make the disease screening and the management of the key crowd, for all the staff COVID-19 virus antibody detection and nucleic acid detection, efforts to achieve the "three zero" (zero infection, zero spread, zero death) prevention and control of the target.

It is a new highlight of the epidemic prevention and control work in Shenmu City Hospital to carry out treatment by means of information. With the help of the consultation APP platform of AnTai, the hospital has built a convenient way for "Internet + medical" treatment, and opened remote consultation for patients with hospitalization and fever. Through the remote video link between the consultation center on the 13th floor and the doctor on duty through the information platform, all suspected COVID-19 patients and high-risk patients admitted to the hospital can be comprehensively analyzed and judged, and the "one person, one plan" can be implemented to carry out scientific, efficient and orderly treatment. At the same time, the epidemic information can be released in a timely manner, information sharing can be realized, and network training can be carried out with information technology to effectively avoid crowd gathering and reduce the pressure of prevention and control.

The prevention and control work in Shenmu City Hospital has been comprehensively deployed and the prevention and control measures are effective. With sufficient staff, clear division of labor, scientific and reasonable arrangement of medical treatment procedures, effective

population diversion, avoiding cross-infection, and strict control of nosocomial infection in medical institutions [12]. So far no COVID-19 confirmed cases, but the current our city still is in the enterprise to stay and hospital visit superposition times, COVID-19 epidemic prevention and control situation is still severe, the hospital still must, in accordance with requirements of the departments at all levels in the provinces and cities, to overcome difficulties, scientific prevention, timely rectification implementation, to the best of the ability to do practical, do fine, make COVID-19 epidemic prevention and control work, to guarantee people's lives and safety in the city.

6. CONCLUSION

Shenmu City Hospital is one of the first designated hospitals for COVID-19 prevention and control in Shaanxi Province, providing health services for 540,000 people in the city and preventing and controlling COVID-19. In the face of major public health emergencies, our hospital in time to establish scientific decision-making mechanism, and take effective prevention and control measures, make the epidemic prevention and control work achievements, effective prevention and control strategy, the implementation of the "three zero" (zero infection, zero spread, zero death) is of great significance, is worth reference and promotion of domestic and foreign counterparts.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical permission has been collected from the Hospital Authority.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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