Yulin Children's Hospital's Response to COVID-19 Epidemic Prevention and Control Measures and Effects

Li Huirong1*

1Yulin Children's Hospital, 719000, China.

Author's contribution
The sole author designed, analysed, interpreted and prepared the manuscript.

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Objective: Introduce the prevention and control measures and effects during COVID-19, and provide a basis for strengthening the emergency response ability of children's hospitals to respond to public health emergencies.

Methods: Introduced the epidemic prevention and control measures of the Children's Hospital of Yulin City, Shaanxi Province from January 22 to July 31, and summarize the prevention and control effects.

Results: During this period, according to the relevant national guidelines and regulations, the hospital established a reasonable hospital management model, formulated scientific prevention and control plans, and introduced effective prevention and control measures, realizing zero infection among front-line medical workers, zero spread of the epidemic in the hospital, and zero death among confirmed patients in the hospital.

Conclusion: The prevention and control work of Yulin Children's hospital has comprehensive overall deployment and effective prevention and control measures, which has certain reference significance for the prevention and control work of large comprehensive children's specialized hospitals.

Keywords: Children's hospital; COVID-19; epidemic prevention and control; Yulin.

*Corresponding author: Email: 9429777160@qq.com, 476877595@qq.com;
1. INTRODUCTION

Since December 2019, an outbreak of COVID-19 (hereinafter referred to as "COVID-19") has occurred in Wuhan, China, and subsequently spread across the country. COVID-19 is characterized by insidious onset, high infectivity, high population susceptibility, rapid spread, wide spread and diverse clinical manifestations [1-3]. How to carry out epidemic prevention and control in a rapid, orderly, systematic and high-quality manner in large comprehensive children's specialized hospitals has become the focus and difficulty of the work. COVID-19 after the outbreak, on January 22, 2020, Children's Hospital of Yulin city of Shaanxi province were identified as the first batch of Yulin city designated hospital treatment, in the provinces and cities in the health select committee, under the guidance of reference always severe acute respiratory syndrome (SAR - S), the highly pathogenic avian influenza prevention and control experience [4-5], in combination with the practical situation of the hospital the overall deployment, arrangements for the prevention and control of science, a strong prevention and control measures. As of July 31, 2020 cumulative cases confirmed 324 cases of hospital belongs to shaanxi province, of which 4 cases were diagnosed in Yulin city, although the number is not high, but in COVID-19 normalized epidemic prevention and control of the situation, to be ready to play "protracted war", Yulin population of about 3.8384 million, is located in the weald jin at the boundary of five provinces and regions, latitude 38 n, longitude 109 e, the hundreds of thousands of children's health and epidemic prevention services for guidance. Since receiving the task, the hospital before the plan, active preparations for war. This paper mainly introduces the prevention and control measures and effects of Yulin Children's Hospital, which is located in the hinterland of the northern Shaanxi plateau, during the epidemic period, so as to provide a basis for strengthening the emergency response capacity of children's specialized hospitals in public health emergencies.

2. METHODS

2.1 Prevention and Control Countermeasures

2.1.1 Rapid response and establishment of working institutions with clear responsibilities

COVID-19 prevention and control organizations have been set up according to work requirements and actual hospital conditions. The prevention and control teams at the hospital level are the COVID-19 Joint Prevention and Control Leading Group, the expert treatment group, the monitoring and reporting group, the medical group, the nursing group, the infection control group, and the logistics support group. Section-level prevention and control teams are respectively drug guarantee group, material guarantee group, equipment guarantee group, information guarantee group, security guarantee group, infrastructure guarantee group, housing, water and electricity guarantee group, and catering guarantee group. Clear responsibilities of each group, establish a good communication and coordination mechanism, to provide a strong organizational guarantee for the prevention and control work. The leading group meets every day to discuss and make overall arrangements. The two level organizations of the School and the Department each perform their respective duties, cooperate with each other, coordinate with each other, and promote in an orderly way. Each task has its layout, response, implementation, results, inspection, feedback and rectification, and the prevention and control work is carried out in an orderly and steady manner. According to the new characteristics and requirements of the epidemic situation, the emergency response plan should be revised and improved in a timely manner. The two levels of hospitals and departments should cooperate with the clinical departments to form the overall situation of joint management and joint prevention and control [6], so as to achieve the working effect of early detection, early reporting, early diagnosis, early isolation and early treatment.

According to the epidemic situation, the national guidance document [7-8] and the requirements of superior departments, the hospital dynamically adjusted the COVID-19 epidemic prevention and control program in accordance with the actual conditions of the hospital, and the hospital renovated and expanded the pre-test triage, fever clinic and infection ward for many times.

2.1.2 Pre-inspection triage

Two and four pre-inspection sub-offices are set up in the outpatient hall, and the pre-inspection triage offices from epidemic areas and local areas are set up, with the implementation of single-channel, two-way control of entry and exit, and strict management of personnel in and out. The hospital will strengthen the allocation of pre-examination and triage force for door and
emergency, and arrange senior nurses, senior attending doctors and above to participate in pre-examination and triage to ensure the accuracy of triage. Real-name registration of patients in this clinic, inquiries about epidemiological history, close contact history, and temperature monitoring, every staff member who comes to the hospital for treatment must scan the Shaanxi Provincial Health Code and the bright green code. And early identification of patients with fever or respiratory symptoms, guide them to the fever clinic or respiratory clinic for screening and treatment, to prevent infected patients from entering the general medical area to spread COVID-19.

2.1.3 Fever clinics

In the relatively independent area, the standard set up fever clinics, in the case of the original fever outpatient Settings, add children fever clinics, between 1 to "three areas, three-channel (clean area, half clean area, pollution area (The clean area is the place where there is no direct contact with the sick and not contaminated by pathogenic microorganisms. Any place that may be contaminated by pathogenic microorganisms is a semi-contaminated area. Any place that is contaminated by pathogenic microorganisms in contact with patients is a contaminated area), the medical staff channel, patients with pollution, and pollution medical channel)" renovation, increase treatment, therapeutic room, under observation room, waiting room, standby clinic related to clinic, and add one between each of the clinical laboratory, room charges, pharmacy. Set up significant labels to receive patients with fever of unknown cause [9]; Standardize medical treatment routes and procedures: (1) for patients without epidemiological history of fever, they should go to the fever clinic for treatment by themselves. Those with severe symptoms after relevant examination should be kept in the emergency room; those with mild symptoms should be given medical treatment and ordered to stay at home for isolation; (2) has a history of epidemiology of patients with fever patients well protection work shall lead the fever clinic, the doctor to do a detailed epidemiological investigation after the issue of blood routine, C-reactive protein, nucleic acid detection, chest Computed Tomography (CT), pneumonia, respiratory virus, liver meritorious service is, myocardial enzymes and other relevant examination application, fever outpatient service nurse in pursuance and nucleic acid detection, completes the protection of patients with nursing, disinfection by fever outpatients at CT examination, inspection after the completion of the patients under observation room waiting for the results, the doctor according to the results of the inspection nucleic acid negative, chest CT to rule out pneumonia after symptomatic treatment advice home quarantine;(3) For those with negative nucleic acid return and chest CT showing pneumonia, another nucleic acid test should be performed 24 hours after symptomatic treatment; for those with negative nucleic acid return, symptomatic treatment should be given after respiratory department consultation; If the nucleic acid results are positive, more than 2 experts shall be invited for consultation, and then transferred to the infectious department for further treatment, and the terminal disinfection ward shall also be used. At present, the main focus of work in the fever clinic of our hospital has shifted to prevent foreign input, and the task is still arduous.

2.1.4 Infection isolation treatment area

To reconstruction of infection ward, open COVID-19 patients and suspected cases of isolation treatment area, according to the principle of "three areas, two channels" (clean area, half clean area, pollution area, the medical staff channel, patient) set area, patients were treated in isolation treatment, and set up the medical staff in infected families, a layer of isolation of living area, infection external cordon and warning signs. The requirements for isolation and treatment of suspected cases in single rooms should be strictly implemented to prevent cross-infection, medical treatment of isolated patients should be done with all efforts, and control of nosocomial infection and protection of medical personnel should be strictly enforced [1,10].

2.2 To ensure the High Quality of Prevention and Control Work

Ensure sufficient manpower to COVID-19 prevention and control work, the hospital decided to cancel school leadership and medical treatment, nursing and so on more than 10 administrative personnel department functions during the Spring Festival holiday, beneficial to health care, administrative functions, logistics general affairs for a total of more than 150 staff, epidemic prevention and control of hospital COVID 18-19 team, according to the nature of work, work content echelon reasonable arrangement of personnel, positive and effective prevention and control work. According to the
development trend of the epidemic, personnel will be deployed step by step, and scientific rotation and rehabilitation will be carried out to ensure the effective implementation of front-line work. Among them, three first-line medical teams were set up, with a total of 71 medical personnel and logistics personnel assigned, including 25 doctors, 36 nurses and 10 other support personnel. They were mainly responsible for the triage of preliminary examination, fever clinic, screening and diagnosis and treatment of infection ward. In addition, 53 administrative personnel actively participated in the epidemic prevention and control work of the hospital, mainly responsible for the whole chapter establishment, external coordination, material support, training and supervision, assessment and evaluation, etc. In addition, more than 30 logistics and general affairs personnel were assigned to take charge of the renovation and expansion of the infected area, fever clinic, pre-inspection triage, daily sprinkling, cleaning, water, heating and electricity maintenance, order maintenance and other work.

2.2.1 Expert level consultation

In addition to the establishment of medical expert treatment teams, the hospital has also established a high-level expert group composed of senior experts who have participated in the prevention and control of SARS. Experts are deeply involved in and guiding the formulation of hospital prevention and control plans, as well as the investigation and consultation of suspected cases. The system of "tertiary consultation" is adopted for the screening and consultation of suspected cases. The radiology team is responsible for providing imaging consultation support, and the critical care unit and infectious diseases Department are responsible for guiding the treatment and treatment of COVID-19 patients suspected to be critically ill in the hospital.

2.3 The Whole Chapter is Organized to Improve the Capacity of Epidemic Prevention and Control According to Regulations

According to the Suggestions of experts [7-8,11-17]. The hospital has formulated 54 systems, norms and responsibilities, including the work system of the infection department, the work system of fever clinic, and the work system of pre-inspection and triage. Develop 85 procedures for outpatient pre-examination triage of patients, and operation procedures for medical staff to wear and take off isolation clothes, etc. To formulate six emergency plans for COVID-19 infection prevention and control, medical waste management plan for COVID-19 outbreak response, emergency plan for outpatient suspension, emergency plan for COVID-19 prevention and control, novel Coronavirus infection elimination plan, and prevention and control plan for COVID-19 outbreak rebound. We formulated a diagnosis and treatment plan for children COVID-19 (trial version) and a novel Coronavirus combined Treatment plan of Chinese and Western medicine. All departments strictly follow the relevant regulations, and at the same time respond quickly to the problems found in the supervision and make efficient rectification to ensure the effective implementation of the prevention and control work.

2.4 Go All Out to Ensure Adequate Supply of Protective Materials

Protective materials are the key to ensure zero infection of medical personnel and zero spread in hospitals, which determines the success or failure of prevention and control work. The hospital mobilized all staff and collected materials from various parties to ensure the effective supply of materials during the epidemic prevention and control period through strict checks at all levels in terms of supply, distribution and use. According to the documents of the National Health Commission [12], the hospital has formulated the "Interim Provisions on the post and Regional allocation and Use of COVID-19 protective equipment", which specifies the provisions on the receiving, distributing and using of medical protective equipment during the epidemic period, as well as the standards on the post and regional protection and the allocation of materials. The use of prevention and control materials should avoid excessive requirements of some medical staff, and all kinds of materials should be equipped according to the risk level, striving to achieve high quality and efficiency.

Since the implementation of COVID-19 prevention and control work, more than 100 training and drills have been organized, and dozens of assessments have been conducted. The participation rate, pass rate and awareness rate of the whole hospital have been 100%, ensuring the effective implementation of prevention and control work and enhancing the self-protection ability of employees. And timely follow up the science and publicity, guide the
correct direction of public opinion, make health publicity boards, publicity videos, prevention and control brochures and color pages for prevention and control each month, one sense-control manual, one handbook for Medical Waste Management, and one brochure for cough etiquette. I have compiled one book on COVID-19 prevention and control -- “Fighting SARS-CoV with Heart” -- DIAGNOSIS, Treatment and Prevention and Control of COVID-19. Wrote more than 20 personal model deeds of hospital leaders, isolation ward staff, and advanced logistics personnel, more than 10 publicity drafts, produced and published more than 100 epidemic propaganda links, collected letters from the isolation ward, learned from the district people’s hospital news reports, and docked platforms Motivation, the People's Daily Online, Shaanxi Daily, Yulin Daily, Yuyang and other publicity and promotion.

2.5 Implement the Wartime Mechanism to Provide a Strong Guarantee for Ideology and Discipline

2.5.1 Daily consultation
System Since the decision to designate our hospital as one of the first designated hospitals for treatment in Yulin, a special meeting on COVID-19 prevention and control will be held every morning to report the previous day's work and arrange the key work of the day. When necessary, expert groups carry out consultations. So far, more than 100 special meetings have been held.

2.5.2 Supervision
The President of the COVID-19 prevention and control system of the hospital is responsible for overall supervision and overall arrangement of supervision. At the same time, the administrative supervision group and the medical supervision group are set up respectively, which are under the responsibility of the Party branch secretary and the vice President of business. The administrative supervision group is mainly responsible for supervising the renovation and expansion of the four major areas of COVID-19 prevention and control (pre-inspection triage, fever clinic, infectious disease area and emergency first aid), the allocation of protective materials, office and daily materials, and the coordination of external related affairs. The medical supervision team is mainly responsible for the formulation of various regulations, operating procedures, emergency plans and diagnosis and treatment plans for the COVID-19 prevention and control in the hospital. To carry out and supervise the screening of triage patients in advance, reception of fever clinic, isolation and treatment of infection ward, etc.; Screening and screening of general out-patient and inpatient patients and their companions.

2.5.3 Daily report system
(1) A new coronavirus screening table was developed for inpatients, new patients, outpatients, and escorts of the hospital, and a daily screening summary was made and reported.
(2) According to the requirements of provinces and cities, formulate the daily report and zero report of COVID-19 prevention and control, and report to Yuyang District Health Bureau every day; The workload of nucleic acid testing shall be summarized daily and reported online to Yuyang District Health Care Bureau, National Clinical Laboratory Center and National Center for Disease Control and Prevention.

2.5.4 Internet medical service
(1) Appointment booking service. During the epidemic period, hospitals provided various appointment modes such as telephone appointment, web page appointment and WeChat public number link appointment. Patients could fill in their basic personal information on the above appointment interface and preliminarily describe their illness, which effectively alleviated the situation of patients queuing in the rush hours and reduced the risk of cross-infection.
(2) Online consultation. The use of the Internet to consult the disease, especially during the epidemic, has avoided unnecessary travel, providing a new medical model for the fight against the epidemic.
(3) Epidemic question and answer system. Patients can consult and COVID-19 related issues, the system background positive response, for the patients to understand the epidemic information, the popularization of COVID-19 related knowledge, reduce the psychological burden of patients provided a lot of help.

3. PREVENTION AND CONTROL RESULTS
As of July 31, 2020, after more than six months of epidemic prevention and control, Yulin
Children’s Hospital has detected 1 confirmed imported case from abroad, and 3 close contacts of the confirmed case. There have been no new confirmed or suspected COVID-19 cases for 160 consecutive days, and the city has been designated as a low-risk area, marking a major victory in epidemic prevention and control.

3.1 Pre-examination Triage

A total of 5116 patients with initial fever were prechecked and triage, among which 721 were high-risk patients, 2,008 were general patients, and 2,387 were key patients.

3.2 Fever Clinic

There were 721 cases of COVID-19 fever, including 510 cases of adults and 211 cases of children. The general fever clinic received 5,351 visits without misdiagnosis or missed diagnosis.

3.3 Infection Ward

Isolation wards in the hospital diagnosis and treatment of 32 cases, of which 1 case was diagnosed patients and close contacts three confirmed cases, suspected cases of close contacts in 2 cases, Wuhan return four, Wuhan back to yu relieve fever patients in 1 case, nonlocal return Yulin fever cases, 9 cases of local fever personnel 6 cases, all samples were all nucleic acid testing more than 2 times. Among them, 15 special cases, including 10 cases of severe mycoplasma pneumonia, 1 case of lung tumor, 1 case of retroperitoneal massive tumor, 1 case of viral encephalitis and 2 cases of tuberculosis, were detected in the COVID-19 ward, and received active treatment.

3.4 Spare Ward

6365 COVID-19 cases were admitted and excluded, and all patients with related pneumonia were discharged after treatment.

3.5 Laboratory and Imaging Examinations

Laboratory tests: 1117 person-times, including blood routine + whole-course C-reactive protein, erythrocyte sedimentation rate, D-dimer, procalcitonin, pneumonia, mycoplasma pneumoniae titer, respiratory syncytial virus, liver function, kidney function electrolyte and heart damage. Nucleic acid test: 3,219 person-times (3,219 person-times of nasopharyngeal swab, 18 person-times of blood specimen, 26 person-times of sputum specimen, 5 person-times of anal swab); Chest CT examination: 800 cases.

3.6 Follow-up

Patients with COVID-19 fever were followed up 721 times, and none of the patients were followed up positive.

3.7 Another

The hospital was under the control of 5,371 inpatients, including 1,794 patients with fever and 6,150 new patients. A total of 17,980 inpatients and 12,391 outpatients were examined.

Daily report and zero report: 331 times in total.

4. DISCUSSION

The threat of COVID-19 is overwhelming, and many health care workers are fighting valiantly. At the beginning, we were anxious about the daily surge of confirmed cases, because we were faced with an unknown virus, and the presence of invisible asymptomatic patients made us feel the terror of the virus. At present, the prevention and control of COVID-19 from abroad has not been fully contained. There are still clusters of COVID-19 cases in some parts of China, and there is still great uncertainty about the epidemic. According to the official website of the National Health Commission, by 24:00 on July 30, a total of 2,063 imported cases and 88,077 confirmed cases had been reported in China. In the future, our hospital will continue to do a good job in epidemic prevention and control and management of key populations, conduct nucleic acid testing on all staff and health code management on residents, and strive to achieve the “three zeros” (zero infection, zero spread and zero death).

During outbreaks, hospital, in accordance with requirements of the departments at all levels in the provinces and cities [18-20], overcome difficulties and successively through the arrangements for the prevention and control of science, a series of effective prevention and control measures, in the severe cases, the epidemic situation complex still has realized the frontline staff zero infection, nosocomial outbreak and spread of target, ensure the orderly conduct of the medical work. It is suggested that large comprehensive paediatric medical institutions pay special attention to the following points in the epidemic prevention and control work: (1) Pay
attention to the training of medical personnel, improve the awareness and sensitivity of all medical personnel to emerging infectious diseases and their hazards, adhere to standard prevention, and adhere to the bottom line of "zero infection"; (2) Establish a reasonable organizational framework, make scientific, flexible and effective command and dispatch of prevention and control, adjust prevention and control strategies scientifically, and revise and improve the contingency plan to ensure that it becomes a reliable basis and action guide for prevention and control practice; (3) In order to cope with the epidemic, our hospital held daily work meetings, summarized the situation of the day, analyzed the existing problems, studied the work plan of the next day, formed the work briefing of the day, implemented supervision, supervision and daily report system, and ensured the implementation of monitoring, treatment, prevention and control, security and other responsibilities; (4) Attach importance to the physical and mental health of medical personnel in wartime and the humanistic care of infected patients, establish incentive mechanism and life guarantee mechanism, and provide care and professional psychological counseling and comfort.

5. CONCLUSION

The prevention and control work of Yulin Children's Hospital has a comprehensive overall deployment and effective prevention and control measures. The response to the COVID-19 outbreak is a growth for all the medical staff participating in the first-line prevention and treatment of COVID-19. The hospital has accumulated experience in major health and safety emergencies, and has certain reference significance for the prevention and control work of large comprehensive specialized children's hospitals. Under the current situation of normal COVID-19 prevention and control, we need to be prepared for a protracted war. Hospital between functional departments to both division of labor and cooperation, achieve the floor "chess", but also emphasize the party-government integration management mechanism, supervision and procuratorial mechanism and propaganda guidance mechanism, further to make a scientific and effective epidemic prevention and control work, tackling "control and prevention, rescue and treatment" accurate, reoccupy force on resolutely control, not loose on the comprehensive prevention and control, make contributions to play epidemic prevention and control of-the battle.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES


