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Improving the Capacity of Management of Surgical Patients at Viet Duc University Hospital during the Novel Coronavirus Pneumonia Affecting Nationally

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Abstract

COVID-19 (Novel Coronavirus Pneumonia - NCP) has been affecting worldwide, causing the high morbidity and mortality in both community and hospital, impacting to the health care system. As one of the biggest centers of surgery in Vietnam, Viet Duc University Hospital is facing the challenges because of the high risk of infection spreading due to crowded patients and visitors. With the timely guidelines and surveillance from MOH, the hospital has conducted many measurements to improve the preparedness with enhanced surveillance to ensure the normal professional activities. (i) The first implementation is to introduce the guidelines and provide training to health staff on NCP issue. (ii) Secondly, the hospital re-organized the flow-chart of patients at emergency and outpatient area, and surveillance of compliance of staff in preventing the NCP cross-infection. Besides, the hospital has invested to the PPEs, upgraded special isolation at ED, designed negative pressure system in OR for such suspected or positive cases with NCP. (iii) Additionally, promoting the application of information technology for remote consultation, close coordination with other hospitals will enhance the management of patients.

Keywords: COVID-19; Prevention of nosocomial infection; Isolation; WHO; Novel coronavirus pneumonia

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Introduction

COVID-19 or Novel Coronavirus Pneumonia (NCP) is affecting worldwide, causing the high morbidity and mortality in both community and medical facilities, impacting to the health care system. Since December 31st, 2019 to until August 15th, 2020, 21,213,649 cases of NCP (in accordance with the applied case definitions and testing strategies in the affected countries) have been reported, including 760,421 deaths (updated August 15th, 2020) [1].

Infected cases

Asia: 5,435,441 cases; the five countries reporting most cases are India (2,526,192), Iran (338,825), Saudi Arabia (295,902), Pakistan (288,047) and Bangladesh (271,881).

Death cases

Asia: 115,894 deaths; the five countries reporting most deaths are India (49,036), Iran (19,331), Pakistan (6,162), Indonesia (6,021) and Turkey (5,934).

As one of the biggest centers of surgery in Vietnam with more than 70,000 operations performed by year in last three years, and over 260,000 examinations in 2019, Viet Duc University Hospital (VDUH) has been facing the challenges because of the high risk of infection spreading within hospital [2]. At the same time, Bach Mai Hospital as big as VDUH has been impacted by NCP cross-infection [3]. Hanoi authorities' fear the NCP outbreak that began at Bach Mai Hospital located in the City, would be difficult to control since it transferred 5,000 patients to other provinces and other hospitals. From Bach Mai's case, we have tried the best to improve the preparedness to control NCP spreading and to maintain daily professional activities. Aims of this report were to share the experience for management of routine activities during the NCP pandemic and the good preparedness to manage the admitted patients' positive with NCP.

Materials and Methods

Subjects

Statistic of professional activities of hospital from February 2020 to June 2020. Guidelines from MOH, of Viet Duc University Hospital (VDUH) have been implemented during this time, including the training course both direct and online for preparedness NCP control.

Resource deployment: relevant health staff who directly manage the patients, infrastructure of emergency room, isolated ward, operating room and equipment.

Methodology

Methods:

- Train the people to collect the database,
- Statistic the professional activities of hospital in last three years, compare the same period
- Review the guidelines on NCP prevention have been implementing
- Review the patients' flow-charts (conventional and re-organized)
- Observe and record

Tool of research:

- Designed forms to collect the database.

Database process

By SPSS.20.0.

Results

Overall professional activities of hospital in last three years

Table 1.

Comparisons activities in 2019-2020

Figures 1-3.

Resources deployment

Human resource: 370 doctors (37 Professors and Associate Professors; 40 PhD level; 18 Specialist level 2; 200 Master level; 75 Specialist level 1 or orientation level), 1,340 nurses/technicians (20 Masters/Specialist level 1, 248 Bachelors ...).

Facilities: 1,700 beds, 19 centers/clinical departments, 09 centers/pre-clinical departments, and 52 operating rooms.

One ED but no separated outpatient clinics: Every 8 days, the duty team including 15 surgeons from different specialties and about 10 anesthesiologists are in charge of all surgeries on emergency for 24 h, average about 250 patients examined and 30 operations performed daily.

Table 1: Comparison of professions activities last three years.

No.	Description	2018	2019	First 6 months of 2020
1	Examinations cases	266.131	261.166	103.997
	Scheduled			81.729
	Emergency			22.268
2	Outpatients	57.601	46.7	15.515
3	Inpatients	67.016	70.71	30.883
4	Operations	66355	70536	29593

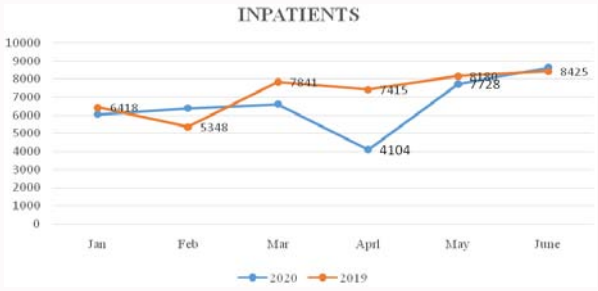

Figure 1: Comparison of patients.

Figure 2: Comparison of examinations.

Figure 3: Comparison of surgeries performed.

Additionally, the outpatient's clinics are opened from 7 AM to 7 PM except weekend, to provide the health services to nearly 1000 patients.

Two trainings to on-duty doctors and doctors involve caring the patients are provided to more than 300 participants: Surgeons, Anesthesiologist, and other such as radiologist, pathology and forensic, nephrologist…. Only assigned doctors allow caring the positive or suspected cases.

Set up the emergency room and new patient's flow chart

Figure 4.

Number of positive NCP cases has been treated: No

However, some cases have been isolated due to fever or come from pandemic areas. Between February 13th, 2020 and August 15th, 2020, there were 21 patients including 19 men, 2 women. Average ages were 45 and 75 years old, average length isolation was 3 to 5 days.

Emergency were 13, including 08 trauma (5 head trauma, 2 multiple trauma, 1 leg fracture), 5 pathologies. Outpatients were 8 (transferred from Bach Mai Hospital). One was operated on emergency due to head trauma.

Detection test was done by quick test for 3 patients, PCR real time

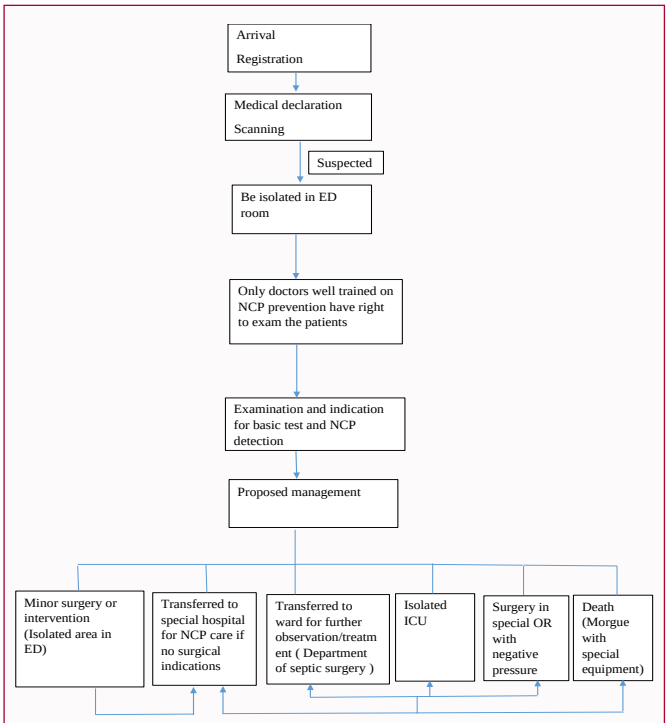

Figure 4: Revised flow chart of patients for NCP control.

for 18 patients. They were all negative with the test. Soon after the test was confirmed, 10 patients were transferred back to provincial hospitals, and 11 continued staying in hospital until discharged day.

Outcomes

No NCP cross-infection within the hospital occurred.

Discussion

Since December 2019, an epidemic of NCP has broken out and quickly affected worldwide which also includes Vietnam. The Health care system has been most affected and facing the challenges in keeping the daily activities and preventing the spreading NCP within the hospital. NCP is a huge burden on health-care facilities causing approximately 2.1% mortality so far. Additionally, evolving understanding of transmission dynamics and the increasing international case load, coupled with growing fear and misinformation, results in formidable pressure on health system to maximize patient scanning, staffing, confirmatory testing, communication, Personal Protective Equipment (PPE) use and patient placement [4,5].

Viet Duc University Hospital (VDUH) is located in downtown of Hanoi, mainly focuses on surgery and trauma care [2]. As a leading center of surgery, the hospital faces the crowded patients, numerous serious cases transferred from lower levels to VDUH, mostly overload in emergency department, neurosurgery, orthopedic and trauma surgery. In last three years, the hospital has performed annually more than 260,000 examinations, and nearly 70,000 operations. On the other hand, as a teaching hospital, it has been receiving many students in whole country for training and clinical practice.

The big concern is VDUH has no separate emergency department and outpatient clinic, management of patients in high risk area implements integrated and unified with the main hospital area. In the face of such an unusual and unpredictable epidemic, how to ensure smooth government order, effective measures, and prevention and control to prevent outbreaks in all division area of hospital is a new test and challenge for hospital.

Although some hospitals in Vietnam have faced with the cross-infection of NCP, however, VDUH is still free from this, and trends to increase the professional activities during the pandemic, especially the surgeries. To achieve this, we would like to discuss the following issues:

- Implementing timely and appropriate policies/regulations from Ministry of Health, WHO on NCP prevention.
- Complying and cooperating from all the staff of hospital on this issue.
- Closely coordinating with other medical facilities in receiving patients.

Set up a leading group for epidemic prevention and control

From the beginning of NCP pandemic, despite being a surgical hospital that is deliberately excluded from the list of some specific healthcare centers delegated to take care of NCP patients by the Ministry of Health, VDUH's Board of Directors pays attention on NCP prevention. Very soon, the Hospital Council for COVID-19 prevention as a leading group for epidemic prevention and control was set, including the Director of VDUH and other members, they are experts of relevant departments and logistic managers such as chief of Planning department, Administration, Biomedical, Pharmacy, Finance. The tasks of Hospital Council are to update the policies/regulation on control and prevention of NCP, to plans the implementation and report, to provide the training and the PPE to Health Care Workers (HCW), to prepare some special isolated area/wards for receiving the patients infected with NCP. The meeting of Hospital Council was held quite often or for any recommendations on emergency. Also the Hospital Council works closely with the Council of MOH on this matter for updating the information/guideline.

The guidelines and regulation selected by the Hospital Council and released to use in hospital. Some guidelines are developed by hospital based on the guidelines from MOH. There are about 112 guidelines/decisions from January 17th, 2020 including nearly 100 from Government/MOH, 36 developed by VDUH. Mostly the guidelines are focusing on improving the preparedness to respond to NCP spreading in hospital, and keeping the hospital safety from NCP infection [6-11].

Strengthen personnel education and training

The outbreak of the NCP in Wuhan has much to do with people's early cognition of and attention to the epidemic and the lack of epidemic prevention knowledge; from organizations to individuals and from professionals to ordinary people, there is a lack of knowledge to different degrees. Therefore, it is particularly important to prevent and control the epidemic in emergency and hospital areas and strengthen education and training for all kinds of personnel. However, HCWs are high risk groups to acquire NCP as it has been reported on Chinese media as well as other hospital in the world [3,4,12,13]. In the report of Yen et al. [14], on MERS-CoV cross-infection in hospital, HCWs infected accounted for 24.4%.

In this aspect, VDUH intends to strengthen the education and training for staff regarding knowledge, information and regulations related to epidemic prevention and control. Nearly 300 physicians

including surgeons and anesthesiologist who directly provide care to patients anticipated two training for updating knowledge on NCP prevention. The planning department is charged to organize the training and survey the compliance of safe practice after these courses. Besides, VDUH has organized the drill at the presence of MOH for responding to real situation.

Additionally, the health council and education to the patients and family through TV, video clip, and other media as well as listening to important speeches and work arrangements online, posters, admission propaganda during the patient's visit or hospitalization were held. For special cases such as the patients stayed at ICU or requirement of social distancing, small unit modes of health council and education were arranged such as bedside or nursing talk.

Organize and coordinate resources

For the prevention and control of any outbreak, personnel and material organization and preparation are necessary. As a noninfectious hospital, the hospital's stock base of protective materials for outpatients without fever was limited.

In order to minimize as much as possible the cross-infection within the hospital areas, VDUH has re-organized the flow chart for emergency and outpatient clinic, and some areas where the patients should go through such as ICU, operating room (Figure 4).

At the registration, all the patients and companions were required to fill out the "outbreak-related investigation form". Being aware about the negative pressure rooms are designed to keep the air circulating in the room of patients with contagious diseases contained in that room only and not to be released into other patient areas and common spaces throughout the hospital [7,15]. One OR with negative pressure has been installed for the NCP positive cases and only one way from here to transfer the patients going through the wards until discharged. Staff of OR were trained to operate the negative pressure. Fortunately, no positive NCP patients were operated on in here.

The entrance and exit of ward were carefully managed and guarded by professional nurses, and access was restricted. Every person entering the ward must verify his/her identity as an employee, patient or visitor, have his/her temperature monitored, and wear a mask, and the residence history of accompanying visitors was carefully checked. All personnel were required to refrain from unnecessary medical activities and prohibited from walking to other places. To reduce crowd gathering, the number of companions was limited to one per patient, allowed to stay depended on the condition of the patient. All the patients and companions were instructed and required to follow up the NCP prevention measurement.

Besides, the management of all staff in medical care, work, property, administration, etc., was strengthened; those who had an epidemiologic history, fever, or other discomfort were strictly isolated, and daily monitoring and reporting were performed. At high risk of NCP spreading, HWC should wear the PPE when contacting with the infection source or suspected patients.

Closely coordinating with other medical facilities in receiving patients

As a referral hospital, VDUH received many patients referred from lower-level hospitals, including many serious patients with complications that require surgical treatment. According to statistics, about 60% of all patients were transferred to VDUH from provinces.

In order to prevent the NCP spreading, still ensuring professional activities, VDUH planned to coordinate well with the lower-level hospitals through programs such as satellite hospitals, directions of health care activities, online consultations.

For the cases that need referrals should be notified in advance, patients had to have full medical declarations and sent to the VDUH doctor before referring in if they come from the epidemic area. The electronic medical declaration was recommended.

Data of first six months of 2019 and 2020 showed that the numbers of professional activities have decreased in 2020 but not much compared the same period. As a center of surgery, only in the first six months of 2020, VDUH has conducted 103,997 examinations, 29,593 operations were performed and 30,883 in patients received the safe treatment during their hospitalization (Table 1) (Figures 1-3).

The control of epidemic prevention in VDUH was effective and we learned that all epidemic prevention measures are not immutable and need to be revised and adjusted according to the development of the epidemic situation and gradually improved. The only constant is the high and close attention to the epidemic situation with the effective support from Government. Effective emergency plans should be formulated from the very beginning, and safety control measures should be taken decisively. Only in this way can the infection be controlled to the minimum.

Conclusion

It is very difficult to manage patients in the surgical hospital which is always crowded by both patients and visitors, especially when the NCP epidemic occurred. To ensure that the hospital works and prevents cross-infection, the comprehensive measurement should be implementing. The commitment from director's board and the strict compliance of medical staff in preventing NCP spreading are mostly important issues. To maintain the health care service, the patients should be scanning from gates to gates with the appropriate flow-chart, and hospital plans to treat the positive with NCP. Additionally, promoting the application of information technology for remote consultation, close coordination with other hospitals will enhance the management of patients. Strengthen the international cooperation helps to improve the ability of prevention and control of NCP infection by sharing good experience.

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