Management Orthopedic Patient With Covid 19, A Picture Of Patient Safety

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Abstract.

This study will describe management policies to maintain hospital services by putting safety and analyze epidemiological data on orthopedic patient with covid-19 infection who were admitted during covid-19 pandemic. A retrospective descriptive study of orthopedic patients with covid-19 infection profile during 1st wave of covid-19 Pandemic (January - March 2021). Modification of patient and staff work flow were also made, based on risk of transmissions, this include rescheduling elective surgery and promoting telemedicine. For patient who were admitted for urgent surgery, transition room were made for screening covid-19 infection before operation, there also a negative pressure operation room for patient who need an emergency operation. There were 38 orthopedic patients admitted to transition room, 18 patient (47.36%) were confirmed covid-19 infection. There are slight fewer female patient with confirmed Covid-19, compare to the male patient 8 (44.4%) vs 10 (55.6%) patient. The Patient's age ranged from 5 to 79 years old, with average of 46.27 years old (SD 20.63). With most patient were 56-65 years old. The patients' diagnosis and demographics data were described in table 1. Five patients (27.8 %) with mild covid-19, nine patients (50 %) with moderate covid-19 and four patients (22.2 %) with severe covid-19. Among 18 patients with confirmed covid-19, seven patients (38.9%) had hypertension and three patients(16.7%) had diabetes . The Laboratory data shows 13 patients (72.7%) had abnormal NLR with all patients had increased D Dimer. Average length of stay were 12.78 days, Range 2 days to 21 days; SD 5,53) with eleven patients (61.1%) underwent operation procedure and 7 (38.9%) patients were on conservative treatment. There was 1 (1.8%0 death case recorded, among patients with confirmed COVID-19, this was a C3 Spinal Cord Injury patient with tetraplegia and respiratory failure. During this period there were 16 (2.5% from 636 staff) were diagnosed with covid-19, among them 60% in red area (operation room, Emergency unit, polyclinics, isolation room and laboratory). There were no documented in hospital death among orthopedic patient with confirmed covid-19 who underwent surgery procedure. Covid-19 had disrupted many aspects in hospital services. Our Hospital had develop new policies and strategies to minimize covid-19 transmission during the 1st wave covid-19 pandemic. Preoperative screening, proper personal protective equipment's, and strict transmissions control successfully minimize covid-19 transmission in our hospital. Orthopedics patient with Covid-19 infection, that require urgent surgery were admitted to isolation room. Prompt treatment according to WHO Guideline were given.]

Keywords: *Oethopaedic.Coronavirus and COVID-19.*

I. INTRODUCTION

Coronavirus Disease (COVID-19) is a severe acute respiratory syndrome caused by Coronavirus, that declared pandemic by the World Health Organization on 11th March 2020 (1). On Weekly Epidemiological Update by World Health Organization published on March 2021, there were 3.8 million new cases reported, and the number of death increasing 5%. All regions reported an increase in the number of cases, with the largest increases in South –East Asia, western Pacific and African regions. The European region and American Region continue to account for 80% of all new and cumulative cases and deaths.

In South East Asia Region, the number of new deaths were reported from India (1797 new Deaths, a 57% increase), as Indonesia reported 917 new deaths, an 18% decreased (2). As a result, the health care system were pushed to made some critical decision, between maintaining their services and containing virus transmission. Restriction of community activities that held by Indonesian Government from 11th to 25th January 2021, made access to health care systems were contracted (3). Some strategies were developed to reduce the risk of disease transmission between health care provider and the patients, as well as preserving health care resources. Rescheduling elective surgery, hospital resources such as operating theatre, ventilator, inpatient bed and personal protecting equipment (PPE) can be preserved (4). Despite all restriction action and policies, the orthopedic trauma community were still operating, as fractures case caused by accident were happening (5).

II. METHODS

We Conducted a retrospective, single-center study, involving all patients admitted to transit ward our during period of January – March 2021, and surveillance data from Infection Control Committee. Our Hospital was a tertiary referral hospital for orthopedic cases, during the COVID-19 pandemic, we opened a transit ward, isolation room, Intensive Care Unit and negative pressure operating room for Covid-19 cases. There were 6 divisions in our orthopedic department, which are pediatrics, spine, musculoskeletal tumor, hand and microsurgery, reconstructions, and sports medicines (6).Data collected from electronic medical records were patient's demographics, admission, diagnosis, laboratory results and average length of stay, we also resume number of health care worker affected by Covid-19 from Infection control Committee data. We performed descriptive statistics for all variables (proportion, mean, minimum and maximum value, and standard deviation/SD).

III. RESULT AND DISCUSSION

During the study period, there were 38 orthopedic patients admitted to transition room, 18 patient (47.36%) were confirmed covid-19 infection. There are slight fewer female patient with confirmed Covid-19, compare to the male patient 8 (44.4%) vs 10 (55.6%) patient. The Patients age ranged from 5 to 79 years old, with average of 46.27 years old (SD 20.63). With most patient were 56-65 years old. Among 18 patients with confirmed covid-19, seven patients (38.9%) had hypertension and 3 patients (16.7%) had Diabetes. The patients' diagnosis and demographics data were described in table 1. Five patients (27.8 %) with mild covid-19, nine patients (50 %) with moderate covid-19 and four patients (22.2 %) with severe covid-19.

Average length of stay were 12.78 days (range from 2 days to 21 days; SD 5,23) with eleven patients (61.1%) underwent operation procedure and 7 (38.9%) patients were on conservative treatment. Laboratory data, 13 patients (72.7%) shows abnormal NLR with all patients shows increased D Dimer. Covid-19 classification, average length of stay and laboratory data described in table 2. There was 1 (1.8%) death case recorded, among patients with confirmed COVID-19, this was a C3 Spinal Cord Injury patient with tetraplegia and respiratory failure. During this period there were 16 (2.5% from 636 staff) were diagnosed with covid-19, among them 60% in red area (operation room, Emergency unit, polyclinics, isolation room and laboratory). There were no documented in hospital death among orthopedic patient with confirmed covid-19 who underwent surgery procedure.

Table 1. Decsription of the Patients demographics data, diagnosis and the surgical procedure

No	Age (year)	Sex (F/M)	Diagnosis	Comorbidites	Surgical procedure
1	79	F	Closed Fracture Ankle sinistra, Denis Weber A	Diabetes	Conservative Casting
2	52	M	Burst Fractures VL 2 Frankle D	Hypertension	Conservative TLSO
3	68	M	Closed Fracture Femur Sinistra	Hypertension	ORIF
4	70	F	Closed Fractures olecranon dextra, closed Fractures head radius dextra	hypertension	ORIF
5	16	M	Closed Fractures Femur dextra		ORIF
6	24	M	Closed fractures shaft femur		ORIF
7	54	F	Tetraplegi due to spinal cord injury C3-C4	Hypertension , diabetes	Conservative with neck colar
8	16	F	Closed Fracture tibial palteu sinistra schatzker V, closed fractures shaft fibula sinistra		ORIF
9	59	M	Neglected fracture Vertebra thoracal 12-Lumbal 1 with grade 3 pressure ulcer	Tuberculosis	Conservative Wound management
10	62	F	Closed Fracture Tibial Plateu sinistra	Hypertension , diabetes	OREF
11	51	M	Closed fracuires patella		ORIF
12	59	M	Fracture compression VL1 frankle E	hypertension	Conservative

				TLSO
13	66	F	Closed Fracture supracondylar femur dextra	ORIF
14	5	F	Closed fracture supracondylar humery dextra - garland type II extension Type	Conservative, casting
15	32	M	Closed Fracture distal radius dextra Frykman type 4, Burst Fracture VL1 Denis Mayor Type B	ORIF, PSF
16	32	M	Closed Fractures shaft Humerus sinistra, transverse	ORIF
17	40	F	Closed fracture tibial plateu sinistra schatzker	Conservative Casting
18	48	M	Open Fracture ankle sinistra, gustilo andersom gr II	Cito debridement and ORIF

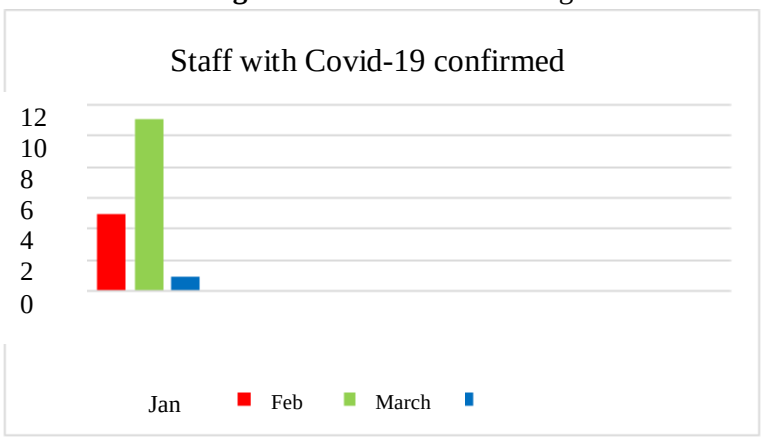
ORIF Open reduction and internal fixation, TLSO thoracic Lumbar sacral osthosis, PSF Posterior spinal fusion

Table 2. Covid-19 classification, laboratory data and average length of stay.

Variable	N (%)	Mean±SD	Min - Max
Covid-19 classification			
• **Mild**	5 (27.8)		
• **Moderate**	9 (50.0)		
• **Severe**	4(22.2)		
Haemoglobin			
• **Normal**	6 (35.3)	12.36±1.72	9.0 – 15.5
• **Abnormal**	12 (64.7)		
Leucocyte			
• **Normal**	6 (35.3)	12772.94±4301.36	6950 - 21590
• **Abnormal**	12 (64.7)		
NL Ratio			
• **Normal**	5 (27.8)	8.18±5.29	2.56 – 17.8
• **Abnormal**	13(72.2)		
D Dimer			
• **Normal**	0 (0)	1640.0±1209.45	600-3700
• **Abnormal**	18 (100%)		
Average Length of Stay		12.78±5.53	2 - 21

NL Neutrophil-to - lymphocyte

Fig 1. Routine Staff Screening



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Covid-19, were caused by corona virus, that can easily spread by droplets during close face to face contact transmission. Infection can be spreads by asymptomatic, presymptomatic and symptomatic carriers. The median age of hospitalized patients range from 47 to 73 years, with most cohorts having a male predominance approximately 60% (14). T Cell capacity of cytokine secretion and proliferation were also more diminished in male compared to female (15) Less robust immune response compared to female, made male were more susceptible to corona virus infection (16). Tian et all (2020) in their study found that most of

covid-19 patient were moderate severity (82.4%), with clinical sign of pneumonia, fever, cough and shortness of breath (17). Shikha et all 2020 found that among hospitalized covid patient hypertension prevalence was 50%, and diabetes accounts on 17%-34% patients, cardiovascular disease (21-28%), Chronic Pulmonary Disease (4-10%), chronic kidney disease (3-13%) (18) When the first Covid-19 pandemic hit, the Indonesian Government have made some pivotal decision, including public travel restriction, implementation of electronic Health Alert Card (eHAC), supporting case detection and tracing for close contact with confirmed case and conducting mass vaccination as a preventive strategy (3). All aspects of medical services in Indonesia have been affected (7). There were several protocols proposed by medical association for performing surgery in the Covid-19 pandemics. Our Hospital have adapted Guideline from Indonesia Ministry of Health, which arranged all aspect of covid-19 management from general policy, internal and external communications including reporting surveillance data, conducting safety medical services in emergency, outpatient clinic, intensive care unit, inpatient wards and operation theater (8). Screening for possibility of corona virus infection were carried out in every entry point in our hospital, by short questioner and thermal detector for every visitors. Hospital staff regularly filled out screening question before taking attendance.

During the first wave of Covid-19 pandemic, our hospital implementing elective surgery restriction, and performing rigorous screening for detecting corona virus infections. Patients who are admitted from outpatient clinics have to performed NAAT test before admission, that include an antigen test for family member. Jesus Vila, 2021 found that from total 7213 patients were preoperatively tested with NAAT, only 85 were positive for an overall infection rate 1.2%. In 18% (15/85) of positive patients, it was not possible to determine symptomatology (10). For patient who are admitted from emergency room, a transit ward were set, as anticipation when NAAT result were delayed. This protocols added extra days on hospitalization, thus average length of stay were extended.Patient with open fracture grade 3 or above, were set for an emergency operation (13) in the negative pressure operation room. When orthopedic case were not an emergency situation, patient with Covid-19 confirmed were treated until NAAT results were negative, only then the operation were performed. Indonesia Orthopedics surgeon association (PABOI) guideline states, patient triage selection, should made by considering patient and health care worker safety. If the patient needed an urgent operation, less invasive techniques were preferred, by minimalizing aerosol generating procedures (11). Routine laboratory test were carried out, including Routine blood study, NLR, CRP, liver and renal function test, D Dimer for suspected or confirmed patient, and Chest X Ray. A systematic review of 19 studies of 2874 covid patients in China, shows typical range of laboratory abnormalities found in Covid-19, including lymphopenia which presents in 83% hospitalized patient with Covid-19. D Dimer and Lymphopenia have the largest prognostic association (18,19)

Health care worker plays an important role in containing corona virus transmission, maintaining a sufficient number of healthy staff is a hard task, regarding rapid transmission of Coronavirus (9) Studies Cites in a living rapid review commissioned by WHO on the epidemiology and risk factors for Covid-19 and other coronaviruses in health workers found that estimates of SARS-Cov-2 infections among health care worker vary significantly across studies. The incidence of SARS-CoV-2 infection (PCR-positive) ranged from 0.4% to 49.6% (12). In our study, there were 2.5% (16 out of 636 Staff) were confirmed Covid-19. World Health Organization have release an interim guideline on Covid-19 management, including Prevention, identification and management of health care worker infection in the context of Covid-19. Health care worker and those with comorbidities or age more than 60 were suggested to work from home, and telemedicine were also performed. Proper use of personal protective equipment, playing an important role for minimalizing risk of coronavirus transmission. There were 3 level of PPE, Level 3 include, respirator or N95 mask and face shield were used when there are risk of aerosol generating procedure, including manipulation of upper respiratory tracts. In any situation, where health care worker were exposed to corona virus transmission, contact racing and temporary quarantine were carried out, and if the NAAT results were positive, prompt treatment were given according to Covid-19 stage, and then they can return to work based on 3 days symptoms free, or 10 days after tested positive (12) There were limtations to this study. This was a descriptive restrospective study, which may have its own weakness. The data were collected from single

orthopedic hospital, where local situation may be differ from general hospital. We only collected data from the first wave (Jan-March 2021), the local situation and pandemic condition may be changing dimanically. However, we believe that this study could give some insight into management of Covid-19 confirmed orthopedics patients

IV. CONCLUSION

Covid-19 had disrupted many aspects in hospital services. Our Hospital had develop new policies and strategies to minimize covid-19 transmission during the 1st wave covid-19 pandemic. Orthopedics patient with Covid-19 infection, that require urgent surgery were admitted to isolation room. Prompt treatment according to WHO Guideline were given. Preoperative screening, proper personal protective equipment's, and strict transmissions control successfully minimize covid-19 transmission in our hospital.

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