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Review Article

Managing Covid 19 Patients: Nurses Role and Considerations

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ABSTRACT

The outbreak of coronavirus disease 2019 (COVID-19) has created a global health crisis. With a death toll exceeding that of the SARS-CoV outbreak back in 2002- 2003 in China, 2019- SARS-CoV2 has led to a public health emergency of international concern, putting all health organizations on high alert. As the largest group of health professionals, Nurses play a key role in the public health response to such crises. Nurses are involved at each level of patient management including prevention and screening, diagnosing and delivering direct care to patients with coronavirus disease. Being a new emerging disease condition, there exist a huge gap in the knowledge and understanding about the nursing care of COVID 19 patients admitted under health care facilities. The present review highlights the important points to be considered while taking care of hospitalized COVID 19 patients.

Keywords: Covid 19; Coronavirus disease; Nurses role; Nursing management in covid; Covid patient care

INTRODUCTION

Nurses are pivotal to the health care response to infectious disease pandemics and epidemics. A recent pandemic of a novel coronavirus (COVID-19 or 2019-CoV) infection has posed significant threats to international health and the economy [1]. The novel coronavirus (2019-nCoV) outbreak, which initially began in China, has spread to many countries around the globe, with the number of confirmed cases increasing every day. In December 2019, a number of patients were admitted to hospitals with an initial diagnosis of pneumonia [2, 3]. On Jan 7, a novel coronavirus (2019-nCoV) was identified by the Chinese Center for Disease Control and Prevention (CDC) from the throat swab sample of a patient [4]. This pathogen was later renamed as severe acute respiratory syndrome coronavirus (SARS-CoV-2) by the Coronavirus Study Group and the disease was named coronavirus disease 2019 (COVID-19) by the WHO [5].

Coronavirus is one of the major pathogens which target primarily the human respiratory system. Coronaviruses are a group of enveloped viruses with non segmented, single-stranded, and positive-sense RNA genomes [6]. Earlier coronaviral outbreaks (CoVs) include Middle East respiratory syndrome (MERS)-CoV and severe acute respiratory syndrome (SARS)-CoV which have significantly caused great threat to human beings. The disease is transmitted by inhalation or contact with infected droplets and the incubation period ranges from 2 to 14 days. The symptoms are usually fever, cough, sore throat, breathlessness, fatigue, malaise among others. The disease is mild in most people; in some (usually the elderly and those with co morbidities), it may progress to pneumonia, acute respiratory distress syndrome (ARDS) and multi organ dysfunction. Many people may remain asymptomatic. The case fatality rate is estimated to range from 2 to 3%. With a death toll exceeding that of the SARS-CoV outbreak back in 2002 and 2003 in China, 2019-nCoV has led to a public health emergency of international concern, putting all health organizations on high alert [7]. Diagnosis is by demonstration of the virus in respiratory secretions by special molecular tests. Treatment is essentially supportive. Prevention entails home isolation of suspected cases and those with mild illnesses and strict infection control measures at hospitals that include contact and droplet precautions [8]. Globally, there have been around 60,105,740 reported cases of COVID-2019 with 17,137,099 numbers of active cases and 1,414,868 reported deaths to date. As of now, there have been 4,44,746 active cases of COVID 19 with 1,34,699 total deaths reported in India (25/11/2020).

As the largest group of health professionals (World Health Organization, 2020), nurses play a key role in the public health response to such crises [9]. Being a new emerging disease condition, there exist a huge gap in the knowledge and understanding about the nursing care of COVID 19 patients admitted under health care facilities. This review comprehensively covers various aspects of nursing management of COVID 19 patients organized following Nursing Process format.

Nursing Assessment

Assessment is the first step in the care of COVID 19 patients which involves critical thinking skills, clinical judgment, risk identification, history, physical examination and appropriate decision making strategies by the nurses.

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History of

- International travel in the last 14 days
- Migration and return from one place to other
- Contacts with laboratory confirmed cases
- Hotspots/containment zones

Physical Examination

- Symptoms of influenza like infection (ILI) such as acute respiratory infection with fever > 38^{0}C AND cough.
- Symptoms of severe acute respiratory infection (SARI) which included acute respiratory infection with fever > 38^{0}C AND cough requiring hospitalization [10].
- Breathlessness
- Fatigue
- Sore throat
- Bodyache
- Chest congestion
- GI upset
- Anosmia
- Ageusia (Altered taste sensation)

Respiratory and Cardiovascular status of Patients

- In respiratory system, check for respiratory rate, breathing pattern, bilateral air entry, breathing difficulty, Spo2 level, PaO_2/FiO_2 ratio, lactate level and radio diagnostic findings
- In cardiovascular system, monitor for Heart rate, Heart sounds, Blood pressure, capillary refill time and Mean arterial pressure.
- Assess pain using visual analogue scale, numerical pain assessment scale or behavioral pain assessment scale as appropriate.
- Assess anxiety.
- Look for development of complications like acute respiratory distress syndrome (ARDS) or any organ failure.

Depending on the assessment findings, various nursing diagnosis can be formulated for the patients. Specific Nursing Diagnosis, Goal and Interventions are explained in the subsequent section:

Nursing Diagnosis

Difficulty in breathing related to disease condition as evidenced by increased respiratory rate, cough, decreased oxygen saturation and use of accessory muscles [11].

Goal

1. To reduce breathing difficulty
2. To promote patient comfort

Nursing Interventions

- Assess for signs of difficulty in breathing such as changes in respiratory rate, breathing pattern, bilateral air entry, breathing difficulty, SpO_2 level and PaO_2/FiO_2 ratio or SpO_2/FiO_2 ratio.
- Provide propped up position
- Monitor vital signs frequently
- Provide humidified oxygen to the patient and titrate it to maintain SpO_2 level of >90%. Antitussive drugs may be administered to the patients to relieve cough as prescribed.
- Maintain hydration of the patient as well as avoid fluid overload to prevent pulmonary congestion.
- Provide ventilator support if needed.
- Monitor ventilator settings. Keep low tidal volume (4-8ml/kg predicted body weight), low inspiratory pressure (< 30 cm H_2O) and high PEEP (10-15 mmHg) [12].
- Suction as and when needed taking all the necessary droplet and aerosol precautions. Use closed suctioning system only.
- Monitor ABG and assess for any deviation.
- Reassess the condition of the patient for monitoring the effect of interventions done.

Nursing Diagnosis

Respiratory failure and Acute Respiratory Distress Syndrome (ARDS) related to disease condition as evidenced by hypoxemia, respiratory distress and decreased Pao2/Fio2 ratio.

Goal

- To prevent hypoxemia
- To relieve respiratory distress
- To maintain oxygen saturation above 90%

Nursing Intervention

- Assess respiratory rate, respiratory pattern, Spo2 level, central cyanosis etc.
- Monitor signs of respiratory distress such as difficulty in breathing, tachypnea, use of accessory muscles for respiration.
- Give supplemental oxygen therapy at 10-15L/min and titrate as per the spo2 level.
- Consider high flow nasal cannula oxygenation (HFNO) or non-invasive ventilation (NIV) if standard oxygen therapy fails.
- Look for contraindications for HFNO and NIV which includes hemodynamic instability, hypercapnea, multi organ failure or abnormal mental status.
- Take aerosol precautions while administering HFNO and NIV to prevent widespread dispersion of exhaled air.
- Reevaluate the response of patient to HFNO/NIV and assess for the further need of intubation preferably within one hour.
- If need of intubation arises (patient acutely deteriorates or does not improve), preoxygenate the patient with 100% Fio2 for five minutes using a face mask with reservoir bag, HFNO or NIV.
- Assist the expert anesthesiologist with ET intubation skillfully to prevent desaturation during intubation.
- Use lower tidal volume (4-8 ml/kg body weight) and lower respiratory pressure (plateau pressure <30cmof H2O) to prevent associated barotrauma and higher PEEP to prevent collapse of alveoli.

- Awake proning and prone positioning can also be practiced depending on the stability of the patient. Prone ventilation for >16 hrs is preferred for patients with severe ARDS. Prone position helps in recruiting more number of dorsal alveoli for oxygenation and prevents the chances of atelectasis.
- Administer fluids conservatively to prevent pulmonary edema and congestion while maintaining adequate tissue perfusion.
- Avoid disconnecting the patient from ventilator which may result in loss of PEEP and atelectasis.
- Consider Extra corporeal life support (ECLS)/Extra corporeal membrane oxygenation (ECMO) in patients with refractory hypoxemia.

Nursing Diagnosis

Impaired hemodynamic status related to disease condition.

Goal

To achieve hemodynamic stability

Interventions

- Assess fluid balance and Skin temperature of the patient
- Assess tissue perfusion by monitoring MAP, capillary refill time, cardiac output, serum lactate level, urine output and level of consciousness.
- Apply conservative fluid strategy to avoid fluid overload. Administer 30 ml/kg of isotonic crystalloid in adults in the first 3 hours.
- Give isotonic crystalloids (RL) and avoid administering hypotonic crystalloids, starches and gelatin.
- Assess fluid responsiveness through passive leg raising test or stroke volume variations.
- Administer medications which include noradrenaline as first line vasoactive drug of choice and dobutamine if inotropes are required.
- Maintain required tissue perfusion targets which include MAP (>65 mmHg), urine output (>0.5 ml/kg/hr. in adults), and improvement of skin mottling, capillary refill, level of consciousness, and lactate

Nursing Diagnosis

Septic shock related to disease condition as evidenced by persisting hypotension with reduced MAP (<65mmHg) and raised serum lactate level (>2mmol/l).

Goal

- To prevent septic shock
- To maintain MAP>65 mmHg.

Nursing Intervention

- Assess for signs of shock such as altered level of consciousness, warm vasodilation with bounding pulse, tachypnea, tachycardia, bradycardia, hyperthermia, hypothermia, oliguria, increased capillary refill time etc.
- Monitor the patient for hypotension, decreased MAP, increased lactate level.
- Administer antimicrobials such as neuraminidase inhibitors as per the prescription within one hour of identification of shock.
- Provide crystalloids preferably ringer lactate to the patient (adults: at least 30ml/kg in the first 3 hours).
- Determine need for additional fluid boluses (250-1000 ml in adults) based on clinical response and improvement of perfusion targets.
- Monitor for volume responsiveness through passive leg raises, stroke volume measurements, variation in systolic blood pressure, IVC size to guide volume administration beyond initial resuscitation,
- Administer vasopressors and inotropes such as noradrenaline and dobutamine respectively as per the prescription of the treating physician.
- Reevaluate the condition of patient to assess the effectiveness of the interventions done and to guide for the further management.

Nursing Diagnosis

Altered thermoregulation related to disease condition as evidenced by raised body temperature

Goal

To bring down the body temperature to normal range

Interventions

- Monitor the axillary body temperature of the patient.
- Remove extra clothing
- Keep the patient's environment cool
- Keep patient hydrated
- Administer antipyretics (e.g. Acetaminophene) as prescribed by the treating doctor.
- Reassess the body temperature.

Nursing Diagnosis

Bodyache related to disease condition as evidenced by patient verbalization, facial expressions and pain rating scale.

Goal

To reduce pain and promote comfort

Interventions

- Assess the level of pain using appropriate pain rating scale
- Provide comfortable position to the patient
- Provide comfort devices to the patient such as pillows.
- Administer analgesics as prescribed by treating doctor.
- Assist patient in performance of activities of daily living
- Use diversion therapy such as music therapy to relieve pain.
- Reassess pain to monitor the effect of intervention done.

Nursing Diagnosis

Altered nutritional status related to disease condition as evidenced by decreased oral intake and decreased weight

Goal

To promote adequate nutritional intake among patient

Interventions

- Monitor weight and BMI of the patient.
- Strictly monitor the intake and output of the patient
- Monitor blood glucose level of the patient.
- Ask food preferences of patient if oral intake is possible
- Provide nutritious food to the patient.
- Encourage small and frequent meals
- Take into consideration other co morbidities like DM, HTN etc while planning therapeutic diet.
- If on NG feeding, check position through chest X-ray and avoid whoosh test (may lead to aerosol generation). Provide feed every 2 hourly or as prescribed.
- If on IV fluids, administer fluids strictly as prescribed.

Nursing Diagnosis

Anxiety related to disease condition as evidenced by frequent questioning and facial expressions of the patient.

Goal

- To alleviate anxiety of the patient
- To provide psychological support to the patient

Interventions

- Assess the level of anxiety as well as patient's support system
- Assess various coping methods used by the patient previously
- Provide comfortable environment to the patient
- Establish good rapport with the patient
- Encourage the patient to ventilate his/her feelings
- Explain the disease process to the patient in a language he/she can understand to decrease fear of unknown
- Answer the queries of the patient.
- Teach different coping strategies.
- Encourage family interaction while maintaining social isolation e.g. through video calling.
- Reassess the patient's anxiety level

Nursing Diagnosis

Fear of unknown related to isolated environment, less interaction and unrecognizable health workers as evidenced by patient's facial expressions.

Goal

To relieve the fear of the patient

Interventions

- Introduce yourself to the patient.
- Make good rapport with the patient.
- Explain the patient about each and every procedure done on him with its need.
- Mention the name and designation of each health worker attending the patient on their scrubs to help the patient recognize their health team members.
- Educate the patient about the need for isolation/uarantine and its expected duration.
- Encourage family interaction while maintaining social isolation e.g. through video calling.
- Orient the patient to time, place and person at each shift.
- Provide a friendly environment to the patient.

Nursing diagnosis

Knowledge deficit related to disease condition as evidenced by frequent questioning, related misconceptions.

Goal

To provide knowledge about the disease process

Interventions

- Assess the knowledge level, education status and preferable language of communication of the patient.
- Encourage him/her to ask questions
- Explain about the disease condition and also the need of wearing mask, importance of quarantine in prevention of the spread of infection
- Use simple language while explaining about the disease process. Avoid medical jargons.
- Involve various health care team members (e.g. nurses, physicians, dietician, and physiotherapists) to provide related information.

Nursing Diagnosis

Risk for multiple organ failure related to disease condition

Goal

To identify and reduce the risk of multiple organ failure

Interventions

- Identify the risk at an early stage
- Assess respiratory compromise manifested as abnormal breath sounds, rhonchi and decreased spo2 levels.
- Assess for renal complications by monitoring urine output, renal function tests etc.
- Assess the cardiovascular system related complications as manifested by alteration in heart rate, bp, CRT, Spo2, heart sounds, weak thready pulse, pedal edema, ECG and Echo (if required).

Nursing Diagnosis

Risk for kidney dysfunction related to disease condition.

Goal

To prevent the onset of kidney dysfunction

Interventions

- To monitor intake output of the patients.
- Provide adequate fluid therapy to maintain urine output of at least 0.5ml/kg/hour for adults.

- Assess the sign and symptoms of fluid overload such as dependent edema, jugular venous distention, crackles on lung auscultation etc.
- Assess renal function test specifically creatinine levels routinely and monitor for any increase.
- Notify the treating doctor for alteration on kidney functions and discuss the need for any change in the therapy.
- Assess the need for dialysis depending on urine output and creatinine levels and discuss with the treating doctor.

Nursing Diagnosis

Risk for stress ulcer related to poor nutritional intake.

Goal

- To reduce the incidence of stress ulcer.

Nursing Intervention

- Assess the ability of the patient for oral intake.
- Give early enteral nutrition within 24-48 hours of admission if not contraindicated.
- To prevent stress ulcers, administer Histamine2 receptor blockers e.g. Ranitidine or Proton pump inhibitors (PPIs) e.g. Pantoprazole to maintain the gastric pH as prescribed by the treating physician.
- Look for signs of stress ulcer such as heartburn, bloating, pain in the abdomen, nausea, vomiting, anorexia etc.

Nursing Diagnosis

Risk for pressure sores related to prolonged bed ridden status.

Goal

- To prevent pressure sores.

Nursing Intervention

- Assess the pressure points every shift using pressure ulcer assessment scales such as Braden Scale.
- Change the position of the patient every 2 hourly.
- Provide back care using effleurage, petrissage, tapotement, friction and vibration to the patient to relieve pressure off the pressure points.
- Massage the pressure points like occipital area, ears, scapulas, elbows, wrists, sacrum, buttocks, knees, heels, ankles etc.
- Perform active or passive range of motion exercises to improve circulation.
- Use appropriate comfort devices such as pillows, gel pads etc. to take the pressure off from the pressure points.
- Use alpha mattress for the comfort of the patient.
- Provide high protein, high calorie diet as advised by the dietician, to the patient.
- Encourage early mobilization of the patient.

Nursing Diagnosis

Risk of venous thromboembolism/DVT related prolonged immobilization.

Goal

- To prevent the incidence of venous thromboembolism/ DVT

Nursing Intervention

- Look for signs of DVT such as redness, swelling, warmed of surrounding skin and positive Homan's sign.
- Perform active or passive range of motion exercises to improve circulation.
- Encourage early mobilization of the patient.
- Use pharmacological prophylaxis (low molecular weight heparin or heparin 5000 units subcutaneously twice daily) as per the prescription of treating physician.
- If pharmacological prophylaxis is contraindicated, use mechanical prophylaxis including intermittent pneumatic compression devices, elastic stockings etc.
- If sign of DVT arises, consider Doppler ultrasound to confirm the diagnosis.

Nursing Diagnosis

Risk for the development of ventilator associated pneumonia related to intubation, frequent suctioning and non-adherence to infection control practices.

Goal

To reduce the incidence of ventilator associated pneumonia.

Interventions

- Perform regular antiseptic oral care using chlorhexidine mouth wash or gel.
- Oral intubation is preferable to nasal intubation.
- Keep the patients in semi recumbent position elevating the head end up to 30-40 degree.
- Use a closed suctioning system.
- Use a new ventilator circuit for each patient.
- Change circuit if it is soiled or damaged but not routinely as a part of aerosol precautions.
- Periodically drain and discard condensate in tubings.
- Change heat moisture exchanger when it malfunctions, soiled, wet or every 5-7 days.
- Consider specialized endotracheal tubes with sub glottis suctioning devices to limit aspiration of oro pharyngeal secretions.
- Perform daily coordinated spontaneous breathing trial and assess for readiness to wean off the patient from ventilator.
- Administer stress ulcer prophylaxis which includes use of proton pump inhibitors (e.g. Pantoprazole).
- Administer DVT prophylaxis consisting of low molecular weight heparin or elastic stockings.
- Avoid disconnecting the patient from the ventilator which results in loss of PEEP and atelectasis.

Nursing Diagnosis

Risk for catheter related blood stream infections related to invasive catheter lines.

Goal

To prevent catheter related blood stream infections.

Interventions

- Consider the safest insertion site.
- Follow aseptic technique during insertion of catheters.
- Use appropriate barrier precautions when inserting and handling the catheter(s).
- Perform hand hygiene before and after touching the catheter site.
- Assess the local signs of infection such as redness, swelling, secretions at the site of insertion.
- Monitor the patient for fever, leukocytosis, leucocytopenia as systemic signs of infection.
- Perform catheter care using 2% chlorhexidine gluconate.
- Review the necessity of line on daily basis and remove catheter if no longer needed.
- Follow a standard catheter related blood stream infection (CLABSI) Bundle and maintain records regularly.

Nursing Diagnosis

Risk for fluid overload related to excessive fluid administration.

Goal

To prevent fluid overload

Interventions

- Assess the need for fluid administration.
- Assess intake output and weight of the patient routinely.
- Administer fluids judicially as fluid overload may lead to pulmonary and cardiac complications.
- Follow fluid administering protocol strictly.
- Look for fluid responsiveness.
- Assess for signs of fluid overload such as edema, shortness of breath, jugular venous distension, crackles on lung auscultation or hepatomegaly (especially in children).
- Monitor for radiographic changes of fluid overload such as pulmonary edema.
- Monitor for perfusion targets including MAP>65mmHg, urine output >0.05ml/kg/hr. (adults), improvement of skin mottling, capillary refill, level of consciousness and serum lactate levels.
- Restrict fluids if signs of fluid overload persist.

2Nursing Diagnosis

Risk for cross infection to health care team members related to the infectious nature of the disease.

Goal

To prevent cross infection

Interventions

- Perform meticulous hand hygiene following five moments of hand hygiene.
- Follow respiratory hygiene and cough &mask etiquettes strictly.
- Provide appropriate PPEs to each and every health care team members attending the patient based on the risk profile, activities, settings and dynamics of disease transmission.
- Use water resistant and disposable PPEs.
- Train and conduct mock drills on donning and doffing of PPEs.
- Keep donning and doffing area separate.
- Practice buddy approach to ensure the proper use of PPEs.
- Handle respiratory secretions carefully.
- Take extra cautious while assisting or performing aerosol generating procedures such as suctioning, ET intubation, nebulization etc. Aerosol generating procedures should be done in negative pressure rooms with at least 12 air changes per hour.
- Disinfect all the surfaces (except metals), using 1% hypochlorite solution frequently. For disinfection of metals, use 70% isopropyl or ethanol [13].
- Handle the linens carefully and soak them in 1 % hypochlorite solution before sending to laundry.
- Follow COVID 19 Bio medical waste management protocols strictly.
- Strictly adhere to the bio safety measures while handling and transporting the specimens.
- Health care team members must ensure to maintain proper nutrition and hydration.
- Health care team members having flu like symptoms, immunocompromised or pregnant females should not be posted to take care of COVID patients.
- Make sure the entire staff that takes care of COVID patients is aware about infection control practices.
- Report any direct or indirect accidental exposure to body fluids, secretions or excretions as per the hospital protocol.

Evaluation

This final step of the nursing process is vital to a positive patient outcome. Evaluation is an ongoing process. Whenever a healthcare provider intervenes or implements care, they must reassess or evaluate to ensure the desired outcome has been met. Reassessment may frequently be needed depending upon overall patient condition. The plan of care may be adapted based on new assessment data [14]. Nurses must ensure to evaluate the patients following each intervention to guide further planning and management.

Discharge Teaching

- Make sure that patient and his/her family members understand the discharge instructions, need for follow up (if any) and warning signs for which to seek medical attention
- Provide written discharge summary to the patient
- Teach proper isolation technique, hand hygiene and cough etiquettes [15].

- Explain the importance of quarantine to the patient.
- Explain the medications prescribed to the patient with its side effects.
- Describe how to wash hands, wear mask and disinfect surfaces at home.

CONCLUSION

Nurses being the frontline COVID warriors must have adequate knowledge and skills to manage COVID 19 cases effectively. They are required to keep themselves updated with the new guidelines on COVID 19 from authentic resources. This will improve their confidence in dealing with such cases and patient outcome as well. This review provides knowledge on nursing management of patients with COVID 19 based on the recent available information. This will be helpful in empowering the nursing task force to provide quality care to the patients and to deal with this pandemic in the best way possible.

ETHICAL APPROVAL

Not Applicable

AUTHOR CONTRIBUTION

Both authors have participated in literature review and manuscript preparation.

CONFLICT OF INTEREST

Ms Tarika Sharma is in the editorial board of the current journal.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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