CASE REPORTS

CHRONIC VENTILATORY SUPPORT IN A CRITICALLY ILL PATIENT

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INTRODUCTION

Most patients admitted in the intensive care unit require some form of respiratory support. The support offered ranges from oxygen therapy by face mask through non-invasive techniques such as continuous positive airway pressure (CPAP) to full ventilatory support with endotracheal intubation. Mechanical ventilation replaces or supplements normal ventilation by the pulmonary system. In most instances the problem is primarily that of impaired CO2 elimination (ventilatory failure). In other cases, mechanical ventilation may be used as an adjunct in the treatment of hypoxemia (Hypoxic Respiratory Failure)[1]. Mechanical ventilation may be indicated in many disorders. The main reason for instituting mechanical ventilation (MV) is the patient's inability to oxygenate adequately. The loss of adequate alveolar ventilation, may be secondary to primary abnormalities of the pulmonary parenchyma, such as pneumonia, pulmonary oedema, or systemic disease that indirectly compromises pulmonary function, in all these conditions the basic etiopathogenic mechanism is severe injury of the capillary-alveolar membrane leading to hypoxic respiratory failure. CNS dysfunction and Neuromuscular impairment, leads to ventilatory failure [1,2]. Chronic Ventilator dependence means the use of mechanical ventilation for at least six hours daily for at least twenty-one days [3]. Tracheotomy is usually done electively when intubation is likely to be prolonged (over 14 days). This may also be done for the patient's comfort and to facilitate weaning from the ventilator. Tracheotomy is often done as a percutaneous procedure in intensive care. Patients tolerate a tracheotomy much better than an orotracheal tube, sedation can usually be reduced, weaning is more rapid, and the stay in intensive care is reduced, it may help with tracheal toilet in patients with copious secretions and poor cough effort [1,2]. Many patients, who previously would have died from respiratory failure, now survive. Better ventilatory and monitoring equipment and improved understanding and management of lung and ventilation pathology have played an important role in improved prognosis.

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CASE REPORT

A 62 years old lady suffering from hypertension and supraventricular tachycardia for the last thirty years, who was on different medications. On 27th Jan 2001 she suddenly developed weakness in limbs, her talk became irrelevant and incoherent and was unable to stand, she was brought to the hospital, and a supportive treatment was started. After 6-7 hours, her power in limbs was restored to a larger extent but her breathing was still laborious. She was given oxygen with mask and treated with supportive pharmacological measures. After about a week's stay at the hospital she was discharged with almost complete recovery.

On 24th July 2001 she again had the similar problem at her home, and after about 12 hours she went in to respiratory arrest with almost no respiratory effort, her pulses were feeble and the blood pressure was not recordable. She was resuscitated and brought to the PAF Hospital Sargodha, where she was intubated and placed on the ventilator. Initially controlled mechanical ventilation

(CMV) mode was used and after 6-7 hours when she started making some respiratory effort was switched over to synchronize intermittent mandatory ventilation (SIMV) mode. She was shifted to Sheikh Zayed Hospital Lahore on the request of her daughter who was doing her House job there. Over there she was thoroughly investigated, apart from other investigations MRI of brain and cervical spine was carried out, which revealed only senile atrophic changes. EMG and Nerve conduction studies were carried out, which were normal but the patient, had no respiratory effort. Tracheotomy was performed and her respiration was supported with SIMV mode. After about 20-25 days weaning off the ventilator with T-piece was attempted but was unsuccessful. The Patient was transferred back to PAF Hospital Sargodha for further management. Here she remained on the ventilator. Weaning off was attempted repeatedly but she could not stay off ventilator for more than 12-14 hours. Decision to wean off or initiate mechanical ventilation was based on the clinical assessment, such as inadequate oxygenation indicated by progressively falling SpO2 on pulse oximeter, despite of oxygen inhalation through tracheostomy tube, tachypnoea, tachycardia, and use of accessory ventilatory muscles. Since then and till today she is daily put on ventilator at night for about 5-6 hours, to make her sleep comfortable, because she cannot sleep with out the ventilatory support. Nutritional support is not a problem in our patient as she is fully conscious, cooperative, and can take food orally. She is maintaining a constant weight of 58 Kg despite of a prolonged ventilatory support. During the last 3½ years on ventilatory support whenever she develops respiratory tract infection the interval of respiratory support is increased.

DISCUSSION

Chronic Ventilator dependence has been defined as use of mechanical ventilation for at least six hours daily for at least twenty one days [3]. In the past, patients who were ventilator dependent for part or all of the day comprised mainly those who failed to wean after bouts of acute respiratory failure (e.g. post poliomyelitis) [4]. The awareness that ventilation is an effective treatment for a wider range of indications, has led to a rapid increase in the number of ventilator assisted individuals. Small portable ventilators face and nose masks that allow non-invasive, intermittent positive pressure ventilation have made mechanical ventilation practical in a wider range of patients. It can improve quality and duration of life in-patients with the chronic hypercapnic ventilatory failure caused by restrictive chest wall disease, spinal cord injury, slowly progressive neuromuscular disease, central hypoventilation or obesity hypoventilation syndrome [5].

A case control study from Papworth hospital in the United Kingdom showed that patients managed in a specialized weaning centre had a higher rate of survival to discharge from hospital than control subjects receiving conventional management (94 % versus 59 %)[6]. In France, a survey of ventilator assisted individuals, mean survival for those with a neuromuscular disease and kyphoscoliosis was 6.5 and 8 years respectively [7].

It is believed that the initial care for patients who become ventilator dependent should be provided in designated acute care hospitals by specialized units with expertise in their management. This was the main reason that, our patient was taken to Sheikh Zyed Hospital Lahore. Such units can under take weaning from continuous ventilatory support or initiation of nocturnal ventilatory support with a multi disciplinary team approach that focuses on pulmonary and general rehabilitation. Winck jc, et al. did a study to compare the tolerance and physiologic effects of treatment with either nasal proportional assist ventilation (PAV) or pressure support ventilation (PSV) in patients with chronic ventilatory failure. They

found that both modes have similar tolerance and were equally effective in reducing daytime hypercapnia and improving nocturnal saturation and symptoms; however PAV induces less nasal and oral dryness [8]. In our patient we generally used SIMV mode during nocturnal ventilation with satisfactory results, as the patient has comfortable sleep and air passages remained dry clinically.

CONCLUSION

Appropriate treatment of hypoxia and early referral to institutes, having the required expertise and equipment, can improve the outcome of critically ill patients.

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