



HOSPITAL STAY OF SURVIVED PATIENTS ON MECHANICAL VENTILATION HAVING MORE THAN TWO ORGAN FAILURE

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ABSTRACT **Introduction:** Weaning from mechanical ventilation is the process of reducing ventilator support, ultimately resulting in a patient breathing spontaneously and being extubated. This process can be achieved rapidly in 80% of patients when the original cause of the respiratory failure has improved. The remaining cause will require a more gradual method of withdrawing ventilation. **Objectives:** To study duration of hospital stay in multiple organ dysfunction syndrome **Method:** This is a prospective, observational, descriptive Hospital based study conducted in the pulmonary medicine department of tertiary health care institute. **Statistical Analysis:** The data obtained from the patients was tabulated in MS Excel program. At the end of the study all the observations were analysed using SPSSR software version 20 IBM. **Result:** In the present study, 27.4% cases were in the age group of 21-30 years followed by 20.5% in the age group 60 years and above. 70.4% patients were males while 29.6% were females. Respiratory rate at the time of admission is significantly correlated with the duration of ventilator stay. However, there was no significant correlation between respiratory rate at admission and duration of IRCU stay or hospital stay. **Conclusion:** More the number of organs involved, greater is the respiratory rate and greater is ventilator, IRCU & hospital stay.

KEYWORDS : Mechanical ventilation, Respiratory rate, multiple organ dysfunction syndrome (MODS)

INTRODUCTION:

Mechanical ventilation has gone through a dramatic evolution over a relatively short space of time. After the Copenhagen polio epidemic in 1952, negative pressure iron lungs were replaced by intermittent positive pressure ventilation, this was originally delivered at set volumes and rates. The next step forward was the introduction of intermittent mandatory ventilation and shortly thereafter this was synchronized to the patient's respiratory effort. More recently, pressure support ventilation and bi-level positive airway pressure model have become available. Modern ventilators are increasingly sensitive, allowing easy patient triggering of supported breaths, models such as tube compensation and measurement of numerous respiratory parameters. Developments in weaning techniques have paralleled these improvements in ventilator functionality. Conventional invasive ventilation is associated with a number of complications such as pneumonia, tracheal stenosis and barotrauma. Many of the complications increase in likelihood with duration of ventilation. It is therefore necessary to wean patients from mechanical ventilation as quickly as possible.

AIM:

To study duration of hospital stay in multiple organ dysfunction syndrome

MATERIAL AND METHOD:

All subjects who were admitted having more than two organ involvement and requiring mechanical ventilation during the month of October 2015 were enrolled in the study. Thus 30 mechanically ventilated patients of intensive respiratory care unit (IRCU) in a tertiary care hospital were included in the study. After getting approval from the ethics committee, written informed consent was obtained from relatives.

Design of the study:

The present study was a prospective, observational, descriptive hospital-based study carried out in the pulmonary medicine department of tertiary health care institute.

Study population:

Study population included the male and non-pregnant female above the age of 12 years. Thus a total of 30 subjects were enrolled in the

study.

Inclusion criteria:

It includes all patients admitted in IRCU having more than two organ involvement.

Exclusion criteria:

Patients on non-invasive ventilation, patients who died during study, patients/ relatives not giving consent to participate in the study were excluded from the study.

METHODOLOGY:

The study was undertaken after approval from the institutional ethics committee. An informed valid consent was taken from relatives before enrolling patients in the study. Detailed history of patients about disease they suffer, respiratory rate on admission, hospital stay, days in intensive respiratory care unit & ventilator was taken. Allied history from partner or relatives were taken. They were evaluated for number of organs involved on admission based on investigations like biochemistry and arterial blood gas analysis. Interventions, treatment were done appropriately according to parameters and diagnosis. Patients were observed for clinical outcome, duration in biochemical, radiological, physiological parameters. Outcome were calculated based on number of days of hospital stay, days in intensive respiratory care unit & ventilator days. The data obtained from the patients was tabulated in MS Excel program. At the end of the study all the observations were analysed using SPSS[®] software version 20 IBM[®].

RESULTS:

Table 1: Diagnosis wise distribution of study subject. (n=30).

Diagnosis	Frequency	Percentage
AFI with ARDS	4	13.3
Bronchial Asthma	2	6.7
COPD	7	23.3
Dengue with ARDS	1	3.3
Hanging	2	6.7
Leptospirosis with ARDS	8	26.7
Post TB OAD	4	13.3
Tetanus	1	3.3
Vivax Malaria with ARDS	1	3.3
Total	30	100

Above table shows that there were Leptospirosis cases with ARDS (26.7%) followed by COPD (23.3%), Post-TB obstructive airway disease and also AFI with ARDS (13.3%), hanging (6.7%), Tetanus (3.3%), bronchial asthma (5.7%) diseases in present study.

Table 2: Hospital stay versus Diagnosis wise distribution of study subject. (n-30)

Diagnosis	Total Hospital stay in Days				
	0-10	10-20	20-30	>30	Total
AFI with ARDS	0	2	0	2	4
Bronchial Asthma	0	2	0	0	2
COPD	4	3	0	0	7
Dengue with ARDS	0	1	0	0	1
Hanging	2	0	0	0	2
Leptospirosis with ARDS	0	4	3	1	8
Post TB OAD	2	1	1	0	4
Tetanus	0	0	0	1	1
Vivax Malaria with ARDS	0	0	1	0	1
Total	8	13	5	4	30

Table 2 shows that hospital stay for patients with various diseases. The average stay of patients with AFI and ARDS was 26.25 days, for patients with bronchial asthma was 15.2 days, for patient with COPD was 9.3 days, for patient with Dengue and ARDS was 19 days, for patient with hanging history was 7 days, for patients with leptospirosis and ARDS was 22.8 days, for post TB OAD was 13 days, for patient with tetanus was 35 days and for Vivax malaria with ARDS was 24 days.

Table 3: More than two organs involvements with hospital stay wise distribution of study subject. (n-30)

No. of organ failure	Total Hospital Stay				
	0-10	10-20	20-30	>30	Total
Three	6	6	1	1	14
More than 3	2	7	4	3	16
Total	8	13	5	4	30

Table 3 depicts distribution of multiple organ failure with duration of hospital stay. The average hospital stay of patients with 3 organ failure was 13.6 days while average hospital stay of patients with more than three organ failure was 21.1 days. This indicates that more the number of organs involvements longer was the duration of hospital stays.

Table 4: Respiratory rate versus hospital stay wise distribution of study subject. (n-30)

Respiratory Rate	Hospital Stay in days				
	0-10	10-20	20-30	>30	Total
Normal	2	0	0	0	2
Increased rate	5	4	2	1	12
Severe tachypnoea	1	9	3	3	16
Total	8	13	5	4	30

In our study, average hospital stay for patients with normal respiratory rate was 7 days, for patients with increased respiratory rate was 15 days while for patients with severe tachypnoea was 20.8 days. This indicates that the hospital stay of patients increases with increase in respiratory rate and with severe tachypnoea.

DISCUSSION:

In this study total 30 subjects were included to find out the outcome of survived patients on mechanical ventilation having more than two organ failure. Most of the cases were in the age group of 21-30 years (27.4%) followed by 20.5% above 60 years of age. In the study 70.4% patients male while 29.6% patients were females.

The largest group of our patient having three or more than organ organ failure were ARDS (26.7%) followed by COPD (23.3%), Hanging (6.7%), Post-TB obstructive airway disease (13.3%), Tetanus (3.3%), bronchial asthma (5.7%). Our findings were consistent with study by Kamat et al¹ The average hospital stay of patients with AFI and ARDS was 26.25 days, for patients with bronchial asthma was 15.2 days, for patient with COPD was 9.3 days, for patient with Dengue and ARDS was 19 days, for patient with hanging history was 7 days, for patients with leptospirosis and ARDS was 22.8 days, for post TB OAD was 13 days, for patient with tetanus was 35 days and for Vivax malaria with ARDS was 24 days. Mean duration of hospital stay in our study were 17.60 days. In their study by Chandrasekhara et al² showed that hospital stay was 25.455 days with a range of 15 to 36 days, stay in the

hospital of tetanus patients until discharge with a range of 23 to 42 days.

In our present study, the average hospital stay of patients with 3 organ failure was 13.6 days while average hospital stay of patients with more than three organ failure was 21.1 days. This indicates that more the number of organs involvements longer was the duration of hospital stays. Our study findings are consistent with Alen E. Jones³.

In our study, average hospital stay for patients with normal respiratory rate was 7 days, for patients with increased respiratory rate was 15 days while for patients with severe tachypnoea was 20.8 days. This indicates that the hospital stay of patients increases with increase in respiratory rate and with severe tachypnoea. Neil Keshvani et al⁴ showed that respiratory rate is an essential vital sign and is a strong predictor of adverse events.

CONCLUSION:

In our study, majority patients were males. Mean duration of Hospital stay in this study was 17.60 days. In our study it is found that as respiratory rate and severity increases the hospital stay also increases. Also it is found that more the organ failure more is the hospital stay. In patients with MODS with pulmonary involvement like COPD, post TB OAD, bronchial asthma were required less hospital stay while in patients with MODS without pulmonary involvement like tetanus required prolonged hospital stay.

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