11 - ANALYSIS OF THE PROCESS OF MECHANICAL VENTILATION WEANING OF AN INTENSIVE CARE UNIT

RAFAEL CASTANHO SILVA
MARCELO JUN IMAI
AMAURY CEZAR JORGE
ERICA FERNANDA OSAKU
CLÁUDIA REJANE LIMA DE MACEDO COSTA
UNIOESTE, Cascavel, Paraná, Brasil
caurejane@yahoo.com.br

INTRODUCTION

Mechanical ventilation (MV), despite being a therapeutic intervention in patients with acute respiratory failure is an invasive procedure and is not without complications. It is estimated that approximately 40% of patients admitted to intensive care units (ICU) are in the MV is therefore therapeutic attitude of high prevalence (SANTOS ET AL., 2007, FREITAS AND DAVID, 2006).

These complications vary with the severity of illness, length of stay in VM and techniques. Delaying the removal of the VM correlates with complications such as pneumonia, barotrauma, laryngotracheal injuries, hemodynamic effects, thromboembolism, muscle atrophy and oxygen toxicity. However, early this removal is related to other risks such as difficulty of access of the airways, impaired gas exchange, as well as pneumonia and increased mortality (GOLDWASSER et al., 2007).

Remove patient from VM can be harder to keep it. The difficulty lies in weaning at about 50 to 30% of patients who can not be removed from the fan in a first or second attempt (GOLDWASSER ET AL., 2007, OLIVEIRA ET AL., 2006).

The practice leads to contemporary issues that empiricism becomes inadequate and insufficient, and clinical decisions, especially in critically ill patients, must have a categorical answer, such as removing or not a patient of artificial ventilatory support and extubated him or not (SANTOS et al., 2007).

Both the VM and the weaning are recent in the history of medicine. This makes these techniques currently have little scientific basis to guide the conduct of professionals who deal with this routine. The experience of the team guided by clinical practice applied only to weaning from MV leads to deterioration in the quality of your process and therefore increase the rate of failure, morbidity and mortality (OLIVEIRA et al., 2006).

Several strategies are proposed for determining the proper establishment and evolution of weaning. The adoption of predictive criteria for weaning can assist in the evaluation and selection of patients able to sustain spontaneous ventilation immediately and those who need this support gradual transition (GONÇALVES et al., 2007).

Weaning protocols studied so far have shown a high degree of efficiency. The use of weaning protocols with scientific rigor and a standardized method can bring several advantages over the empirical weaning, such as: decrease in the relationship between weaning time and total time of ventilation, a significant reduction in the time of weaning, decreased rates of failure and reintubation, decreased mortality, shorter hospital stay and therefore reduce hospital costs (OLIVEIRA et al., 2006).

OBJECTIVE

The overall objective of this study was to evaluate retrospectively weaning from mechanical ventilation in the Intensive Care Unit for adults at the University Hospital of the West of Paraná (HUOP) from January to December 2007.

MATERIALS AND METHODS

We conducted a retrospective descriptive study with analysis of all records of the Department of Physical Therapy, Intensive Care Unit, admitted to the University Hospital of the West of Paraná (HUOP) for the period January to December 2007. This study was approved by the Ethics Committee on Human Research of Unioeste, and then data collection began.

Inclusion criteria: Patients undergoing invasive mechanical ventilation (MV) for more than 24 hours, have more than 18 years. Exclusion criteria: Patients who required the use of VM permanent, such as progressive degenerative neuromuscular diseases.

The patients' medical records were reviewed when necessary, and data collection took place by completing a form elaborated by the researcher. This transcript was made personal data, clinical data, weaning, extubation.

Statistical analysis: Data were described by frequency (if qualitative) and mean and standard deviation or median and ranges (if quantitative), depending on your distribution.

RESULTS

Of the 367 patients admitted to the Intensive Care Unit for adults HUOP, encompassing the period, 89 (24%) were excluded because they were not located the chips for the ventilatory control of the Physiotherapy Service. The sample, then, 278 patients (76%).

Of these, only 161 (58%) belonged to the inclusion criteria and 111 male patients (69%) and 50 (31%) were female, aged on average 47.5 ± 19.04 years. The mean APACHE II score was 22. The mortality rate was 39%.

The average number of days in the ICU was 11.63 ± 10.62 days. In relation to the time of day in both VMI and in hours was 9.27 ± 8.92 and 222.59 ± 213.67 respectively.

Data on causes of admission were divided into six categories: clinical 63, 26 surgical, 51 trauma, 13 neurology / clinical neurology 7 / surgical and obstetric and 1 are shown in Figure 1.

One hundred and two (63%) patients underwent weaning from MV, 88% (90) associated with SIMV pressure support, 11% (11) PSV, and only 1% (1) directly used tube T.

In this same event, 61 (60%) of patients used spontaneous breathing (SBT) and 41 (40%) did not perform. Of the patients who underwent SBT, 60 (98%) were due to the tube T and 1 (2%) for PSV, with an average time of 43.58 in TRE ± 20.88 minutes.

The average hours of early weaning from MV to extubation was 35.6 ± 45.2 hours. The process of weaning from MV and the fate of these patients can be seen in Table 1.

Table 1: The process of weaning from MV - 1st event

		N	%
Weaning modes			
	SIMV + PS	90	88
	PSV	11	11
	TRE	1	2
Destination			
	Extubated	44	43
	Tracheostomy	29	28
	kept on MV	9	9
	Extubated and reintubated (= 48h)	17	17
	Extubated and reintubated (= 48h)	3	3

Regarding the failure of extubation in the period studied, 20 (12%) patients had to be reintubated within less than 48 hours. Of the 161 patients belonging to the study inclusion criteria, 8 (5%) had unplanned extubation.

DISCUSSION

The diversity found in the scientific literature about the weaning from MV is fact. This lack of consensus among the publications is observed since the parameters used to start the weaning process until the withdrawal of ventilatory assistance and define what is considered success or failure during mechanical ventilation (OLIVEIRA et al., 2002).

In this retrospective study period of 1 year, 58% of patients remained on MV. The demographics such as gender and age were similar to the findings in the literature.

In a study on the epidemiological aspects of mechanical ventilation in Brazil (MVB) performed by Damasceno and colleagues (2006) showed that the average hospital stay of patients undergoing MV was 22 days. Found higher values in comparison to this study (11.63 ± 10.62 days). However, it is noteworthy that the study quoted on the MVB, the sample consisted of patients as severe as the present study - mean APACHE II score equal to 20 versus 22 respectively.

The present study showed similarity with the work of Junior and Menezes (2004), in the rate of mortality (39% versus 42.1% respectively) and mean APACHE II score (21.5 versus 22).

The profile of weaning from MV, 63% of patients underwent this process, with a prevalence of PS + SIMV (88%). Unlike in the study by Damasceno and colleagues (2006), which showed that the PSV mode prevailed during the period of weaning from MV in all Brazilian regions (63.5%), followed by SIMV + PS (12.2%) .

Regarding the use of SBT, the predominance of the T tube was 98%. For best use of spontaneous breathing trial, is not yet defined. However, because of the SBT by T tube proves effective and easily performed in most studies, said to be the most widely used method (Yamauchi, 2005).

In a study on the evaluation of the method of tube T as the initial strategy carried out by Assumção and colleagues (2006), proved effective in about 80% of cases.

The average hours of weaning from MV in a first event was 35.6 ± 45.2 hours. In the study by Freitas and David (2006), the average time of weaning was 26.88 hours.

63% of patients who underwent weaning, 43% and 28% were extubated tracheostomy. Regarding the study of Frutos and colleagues (2005), the main cause for performing tracheostomy is the failure of weaning from MV, which corroborates the present study.

The unplanned extubation of adult patients admitted to the ICU during the study period the HUOP was 5% (8 patients), and 5 of these were weaned from MV. Similar to the study of Tanios et al (2006), which in its variables observed that 6% (9 patients) had unplanned extubation and were in the period of weaning from MV.

The present study had some methodological limitations inherent in retrospective studies. The analysis of medical records can often be compromised by loss of records, or even do not appear essential data of hospital patients as well as a standardization of the same.

For future research, we suggest prospective cohort studies or clinical trials with methodological designs and treatment protocols developed widely, not only to elucidate the use of the protocol, but the effectiveness of the use of weaning methods available in this ICU.

This will allow to assess whether there is a reduced length of stay of patients, the deleterious effects that hospitalization itself causes as well as hospital costs that could cause a prolonged weaning. This evaluation is not possible in retrospective studies by methodological variability and the ethical implications.

CONCLUSION

There was great variability in the observed modes used and the choice of parameters for the achievement of weaning from MV, suggesting, then, the presence of a routine service in the realization of this process.

The weaning time was better compared to some studies, however, this can be explained by the characteristics of the sample is composed of more severe patients.

The data regarding the manner and time of weaning in the ICU did not corroborate with the literature. In this study it was observed that the use of SIMV + PS in weaning from MV not extended the period of hospitalization of patients, even with other similar studies on the clinical severity of them.

REFERENCES

ASSUNÇÃO, MSC; MACHADO, FR; ROSSETI, HB; PENNA, HG; SERRÃO, CCA; SILVA, WG; SOUZA, AP; AMARAL, JLG Avaliação de teste de Tubo T como estratégia inicial de suspensão da ventilação mecânica. Revista Brasileira de Terapia Intensiva, v.18, n.2, p.121-125, abril – junho, 2006.

DAMASCENO, MPCD; DAVID, CMN; SOUZA, PCSP.; CHIAVONE, PA; CARDOSO, LTQ; AMARAL, JLG; TASANATO, E.; SILVA, NB; LUIZ, RR Ventilação mecânica no Brasil. Aspectos epidemilógicos. Revista Brasileira de Terapia Intensiva, v18, n.3, p.219-227, julho – setembro, 2008.

FREITAS, EEC; DAVID, CMN Avaliação do sucesso do desmame da ventilação mecânica. Revista Brasileira de Terapia Intensiva, v.18, n.4, p.351-359, outubro – dezembro, 2006.

FRUTOS, VF; ESTEBAN, A.; APEZTEGUIA, C.; ANZUETO, A.; NIGHTIGALE, P.; GONZALEZ, M.; SOTO, L. Outcome of mechanically ventilated Patients who require a tracheostomy. Critical Care Medicine, v.33, p.290-298, 2005.

GOLDWASSER, R.; DAVID, CM. Desmame da ventilação mecânica: promova uma estratégia. Revista Brasileira de Terapia Intensiva, v.19, n.1, p.107-112, janeiro – março, 2007.

GONÇALVES, JQ; MARTINS, RQ; ANDRADE, APA; CARDOSO, FPF; MELO, MHO Características do processo de desmame da ventilação mecânica em Hospitais do Distrito Federal. Revista Brasileira de Terapia Intensiva, v.19, n.1, p.38-43, janeiro – março, 2007.

JUNIOR, AAP; MENEZES, FA Análise da gravidade de pacientes sob ventilação mecânica em UTI de Fortaleza. Revista Brasileira de Terapia Intensiva, v.16, n.4, p.

OLIVEIRA, LRC; JOSÉ, A.; DIAS, EC; SANTOS, VLA; CHIAVONE, PA Protocolo de desmame da ventilação mecânica: efeitos da sua utilização em uma unidade de terapia intensiva. Um estudo controlado, prospectivo e randomizado. Revista Brasileira de Terapia Intensiva, v.14 n.1, p.22-29, janeiro – março, 2002.

OLIVEIRA, LRC; JOSÉ, A.; DIAS, ECP; RUGGERO, C.; MOLINARI, CV; CHIAVONE, PA Padronização do desmame da ventilação mecânica em unidade de terapia intensiva: resultados após um ano. Revista Brasileira de Terapia Intensiva, v.18, n.2, p.131-135, abril – junho, 2006.

SANTOS, LO; BORGES, MR; FIGUEIREDO, LC; GUEDES, CAV; VIAN, BS; KAPPAZ, K.; ARAÚJO, S. Comparação entre três métodos de obtenção do índice de respiração rápida e superficial em pacientes submetidos ao desmame da ventilação mecânica. Revista Brasileira de Terapia Intensiva, v.19, n.3, p.331-336, julho – setembro, 2007.

TANIOS, MA; NEVINS, ML; HENDRA, KP; CARDINAL, P.; ALLAN,JE; NAUMOVA, EN; EPSTEIN, SK A randomized, controlled trial of the role of weaning predictors in clinical decision making. Critical care medicine, v.34, n.10, p.2530-2535, 2006.

YAMAUCHI, LY . Falência do desmame: risco, fatores associados e prognóstico de pacientes sob ventilação mecânica prolongada . USP, 2005. Dissertação (Doutorado em fisiopatologia experimental). Faculdade de Medicina da Universidade de São Paulo, 2005.

Corresponding Author: CLÁUDIA REJANE COSTA
UNIOESTE / Colegiado de Fisioterapia
Rua Universitária, 2069. Bairro: Jardim Universitário.
CEP 85819-110, Cascavel/Paraná - Brazil.
Phone number: (45) 3220-3158.
E-mail: caurejane@yahoo.com.br

ANALYSIS OF THE PROCESS OF MECHANICAL VENTILATION WEANING OF AN INTENSIVE CARE UNIT

It was a retrospective descriptive study designed to evaluate the weaning from mechanical ventilation in the Intensive Care Unit for adults at the University Hospital of the West of Paraná (HUOP), within one year. The study included 161 patients, mean age 47.5 ± 19.04 years. The mean APACHE II score was 22. The average number of days in the ICU was 11.63 ± 10.62 days. Regarding the length of invasive mechanical ventilation (IMV) on both days and hours was 9.27 ± 8.92 and 222.59 ± 213.67 respectively. One hundred and two (63%) patients were weaned on a first event with an average of 35.6 ± 45.2 hours. The predominant mode of weaning SIMV was associated with pressure support. Regarding the failure of extubation, 12% of patients had to be reintubated in a period ≤ 48 hours. There was great variability in the observed modes used and the choice of parameters for the completion of weaning from MV, suggesting, then, the presence of a routine service in the realization of this process. It was also found that the use of SIMV + PS weaning not extended the period of hospitalization of patients, even with other similar studies on the clinical severity of patients.

KEY WORDS: Respiration Artificial , weaning, protocols

ANALYSE DU PROCESSUS DE VENTILATION MÉCANIQUE DU SEVRAGE D'UNE UNITÉ DE SOINS INTENSIFS POUR ADULTES

IIs'agissait d'une étude rétrospective descriptive destinée à évaluer le sevrage de la ventilation mécanique dans l'unité de soins intensifs pour adultes à l'Hôpital universitaire de l'Ouest du Paraná (HUOP), dans un an. L'étude a inclus 161 patients, âge moyen 47,5 ± 19,04 années. Le score APACHE II moyen était de 22. Le nombre moyen de jours à l'USI était 11,63 ± 10,62 jours. En ce qui concerne la durée de ventilation mécanique invasive (VMI) sur les deux jours et heures était 9,27 ± 8,92 et 222,59 ± 213,67 respectivement. Cent deux (63%) patients ont été sevrés sur un premier événement avec une moyenne de 35,6 ± 45,2 heures. Le mode prédominant de sevrage VACI a été associée avec le soutien de la pression. En ce qui concerne l'échec de l'extubation, 12% des patients ont dû être reintubated dans une période de ≤ 48 heures. Il y avait une grande variabilité dans les modes observés utilisés et le choix des paramètres pour la réalisation du sevrage de la VM, ce qui suggère, donc, la présence d'un service de routine dans la réalisation de ce processus. On a également constaté que l'utilisation de VACI + PS sevrage pas prolongé la période d'hospitalisation des patients, même avec d'autres études similaires sur la sévérité clinique des patients ;

MOTS CLÉS: respiration artificielle, sevrage, protocoles.

ANÁLISIS DEL PROCESO DE VENTILACIÓN MECÁNICA DESTETE DE UNA UNIDAD DE CUIDADOS INTENSIVOS DE ADULTOS

Fue un estudio descriptivo retrospectivo diseñado para evaluar la desconexión de la ventilación mecánica en la Unidad de Cuidados Intensivos para adultos en el Hospital Universitario del Oeste de Paraná (HUOP), dentro de un año. El estudio incluyó a 161 pacientes, edad media de 47,5 ± 19,04 años. La media de puntuación en el APACHE II fue de 22. El número promedio de días en la UCI fue de 11,63 ± 10,62 días. En cuanto a la duración de la ventilación mecánica invasiva (VMI) en los dos días y las horas fue 9,27 ± 8,92 y 222,59 ± 213,67, respectivamente. Ciento dos (63%) pacientes fueron destetados en un primer evento con un promedio de 35,6 ± 45,2 horas. El modo predominante de destete VISO se asoció con el soporte de presión. En cuanto al fracaso de la extubación, el 12% de los pacientes tuvo que ser reintubados en un período ≤ 48 horas. Hubo una gran variabilidad en los modos de observar y utilizar la elección de los parámetros para la realización del destete de la VM, lo que sugiere, entonces, la presencia de un servicio de rutina en la realización de este proceso. También se encontró que no el uso de SIMV + PS destete prolongado el período de hospitalización de los pacientes, incluso con otros estudios similares en la gravedad clínica de los pacientes.

PALABRAS CLAVE: La ventilación mecánica. Destete. Protocolos.

ANÁLISE DO PROCESSO DE DESMAME DA VENTILAÇÃO MECÂNICA DE UMA UNIDADE DE TERAPIA INTENSIVA DE ADULTO

Foi delineado um estudo descritivo retrospectivo com o objetivo de avaliar o desmame da ventilação mecânica na Unidade de Terapia Intensiva de adultos no Hospital Universitário do Oeste do Paraná (HUOP), no período de um ano. Foram incluídos no estudo 161 pacientes, com média de idade de 47,5 ± 19,04 anos. O escore APACHE II médio foi de 22. A média de dias internados na UTI foi de 11,63 ± 10,62 dias. Em relação ao tempo de ventilação mecânica invasiva (VMI) tanto em dias quanto em horas foi de 9,27 ± 8,92 e 222,59 ± 213,67 respectivamente. Cento e dois (63%) pacientes realizaram desmame em um primeiro evento com uma média de 35,6 ± 45,2 horas. O modo de desmame predominante foi SIMV associado a pressão de suporte. Em relação a falência de extubação, 12% dos pacientes tiveram que ser reintubados em um período ≤ 48 horas. Não foi observado grande variabilidade nos modos utilizados e na escolha dos parâmetros para a realização do desmame da VM, sugerindo, então, a presença de uma rotina no serviço na realização desse processo. Verificou-se também que a utilização do modo SIMV+PS no desmame não prorrogou o tempo de internação dos pacientes, mesmo apresentando semelhança em outros estudos quanto a gravidade clínica dos pacientes.

PALAVRAS CHAVES: respiração artificial, desmame, protocolos