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Appropriate medical professionals communication reduces intensive care unit mortality

A adequada comunicação entre os profissionais médicos reduz a mortalidade no centro de tratamento intensivo

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ABSTRACT

Objectives: Communication issues between healthcare professionals in intensive care units may be related to critically ill patients' increased mortality. This study aimed to evaluate if communication issues involving assistant physicians and routine intensive care unit physicians would impact critically ill patients' morbidity and mortality.

Methods: This was a cohort study that included non-consecutive patients admitted to the intensive care unit for 18 months. The patients were categorized in 3 groups according to their assistant doctors' versus routine doctors communication uses: DC – daily communication during the stay (>75% of the days); EC – eventual communication (25 to 75% of the days); RC – rare communication (< 25% of the days). Demographic data, severity scores, reason for admission to the intensive care unit and interventions were recorded. The consequences of the medical professionals communication failures (delayed procedures, diagnostic tests, antibiotics, ventilatory weaning, vasopressors) and medi-

cal prescriptions inadequacies (no bed head elevation, no stress ulceration and deep venous thrombosis drug prophylaxis), and their relationship with the patients outcomes were analyzed.

Results: 792 patients were included, and categorized as follows: DC (n=529); EC (n=187) and RC (n=76). The mortality was increased in the RC patients group (26.3%) versus the remainder groups (DC = 13.6% and EC = 17.1%; $p < 0.05$). A multivariate analysis showed that delayed antibiotics [RR 1.83 (CI95%: 1.36 -2.25)], delayed ventilatory weaning [RR 1.63 (CI95%: 1.25-2.04)] and no deep venous thrombosis prophylaxis [RR 1.98 (CI95%: 1.43 – 3.12)] contributed independently for the increased mortality.

Conclusion: The failure in the assistant and routine intensive care doctors communication may increase the patients' mortality, particularly due to delayed antibiotics and ventilation weaning, and lack of deep venous thrombosis prophylaxis prescription.

Keywords: Communication; Intensive care units; Mortality; Quality health care

INTRODUCTION

The intensive care unit (ICU) is highly dependent of state-of-the-art technologies, and manages highly complex and severely ill patients. For this, its staff demands health care professionals able to manage acute situations, psychological tension and imminent risk of death.⁽¹⁾

Due to the natural critically ill patient's complexity, the opinion and active participation of different expertise areas professionals is certainly for improved management. However, health quality studies on the patients' safety have shown that failures in medical communication, and between physicians and other healthcare professionals, is a common cause of ICU adverse events.⁽²⁻⁵⁾ Communication is "the ability to exchange or discuss ideas or information, to dialogue aiming good understanding among people".⁽⁶⁾ Reader et al.⁽⁵⁾ showed that healthcare professionals have different interdisciplinary communication perceptions, and this may lead to different decisions in each case. Most of the studies^(2,3,5,7) correlating communication and health quality involve interdisciplinary communication (physicians versus nurses, physicians versus physiotherapists, nurses versus physiotherapists). Due to the lack of intradisciplinary communication studies (physician versus physician), our study aimed to evaluate if failures in the communication between the assistant physicians and routine ICU doctors' would impact the critically ill patients' morbidity and mortality.

METHODS

This study was conducted in a 31 beds ICU (divided in three ICUs) in a private hospital, and were included only patients admitted to the respiratory diseases unit (characterized by chronic patients), with 11 beds. Being this an "open medical staff" hospital, the ICU admission and discharge indications, as well as decisions and procedures for admitted patients, as well as family members notifications/clarifications, are the assistant doctor's responsibilities. The assistant doctors visit their patients daily, talk to family members, discuss the case with the routine doctor, and record the case development and procedures in the medical chart. It is up to the routine ICU doctors (intensivist physicians) to take care of interurrences and to make decisions only for urgency and risk of death situations. The routine ICU doctors evaluate, discuss the case among them, and record their impressions on the medical chart.

The patients were categorized in three different groups according to their assistant physicians communication with the ICU routine doctors uses: DC: the assistant physicians discussed and communicated with the ICU routine doctors more than 75% of the patient's time of stay; EC: The assistant physicians discussed and communicated their procedures to the ICU routine doctors between 25 and 75% of the pa-

tient's time of stay; RC: the assistant physicians discussed and communicated their procedures with the routine ICU physicians in less than 25% of the patient's time of stay.

Data collection

The data were collected for 18 months. As the ICU routine involves only workdays, the study did not include weekends and holidays patients. Were analyzed: (a) demographic data; (b) severity scores [(Acute Physiology and Chronic Health Evaluation – APACHE II), Glasgow coma scale, and Sequential Organ Failure Assessment (SOFA-24h) first 24 hours]; (c) reason for ICU admission; (d) time of ICU stay; (e) ventilation needs [invasive or non-invasive mechanic ventilation, dialysis therapy, vasopressors, TISS-24h (Therapeutic Intervention Scoring System), and TISS-72h (first 72h)]; (f) consequences of the professionals communication failure [(1) phone calls to the assistant physicians needed for procedures clarification. Total number of unnecessary calls to the assistant physicians over the patients' total days of stay; (2) delay of important decisions (antibiotics start, mechanic ventilation weaning start and vasopressors start, invasive procedures and diagnostic tests). A delay was defined as the time (in hours) from problem detection to its solution. If an aforementioned event took place more than one instance during the stay, the events hours were summed]; (g) medical prescriptions inadequacies (failure to prescribe $\geq 30^\circ$ raised bed head, or failure to prescribe stress ulcer or deep venous thrombosis drug prophylaxis); and (h) ICU mortality.

Statistical analysis

The data were expressed as mean \pm standard deviation (SD) or group percentage. The categorical variables were analyzed using the Chi square and the exact Fisher's tests, when indicated; and the numerical variables using ANOVA. The mortality-associated factors were determined by binary logistic regression, between only the DC and RC groups, being the relative risks (RR) and confidence intervals (95%CI) calculated. A *p* value <0.05 was considered significant. The data were analyzed using the SPSS 14.0 software (Statistical Package for Social Science, Inc., Chicago IL, USA).

RESULTS

A total of 792 patients were included, categorized as DC, *n*=529, EC, *n*=187 and RC, *n*=76. No between

groups differences were found regarding demographics, severity scores, life-support need or reason for ICU admission (Table 1).

The RC group patients stayed longer in the ICU (12.4 ± 4.9 days) versus the other groups (DC = 7 ± 5 days, and EC = 8 ± 5.4 days; $p < 0.05$). The three groups were different regarding unnecessary phone calls, delayed invasive procedures and failure to prescribe raised bed head. The RC group was different regarding ventilatory support weaning delay, antibiotics and vasopressors' delay, and deep venous thrombo-

sis prophylaxis prescription. No difference was seen regarding the time to diagnostic tests and digestive hemorrhage prophylaxis prescription. The mortality was different for the 3 groups: DC, 13.6%; EC, 17.1%; and RC, 26.3% ($p < 0.05$).

The logistic regression for the "communication failure consequences" and "medical prescription adequacy" variables showed (Table 2) that the delayed antibiotics start [RR 1.83 (95%CI: 1.36-2.25)], and delayed ventilatory weaning [RR 1.63 (95%CI: 1.43-3.12)] independently contributed for increased patients' mortality.

Table 1- Patients' demographics, severity, hospitalization and prognosis information related to assistant physicians and routine intensive care unit doctors communication

Variable	Communication		
	Daily (DC) N = 529	Eventual (EC) N = 187	Rare (RC) N = 76
Age, years	63.4 ± 19.2	62.9 ± 21.5	60.7 ± 17.3
Male (%)	315 (59.5)	108 (57.7)	48 (53.1)
Severity scores			
Apache II	15 ± 4	16 ± 5	14 ± 3
Glasgow	12 ± 2.1	12 ± 2.5	12 ± 2
SOFA-24h	4.2 ± 3.4	4.3 ± 3.1	4.1 ± 3.7
Reason for ICU admission (%)			
Sepsis	180 (34)	65 (34.7)	26 (34.2)
Stroke	89 (16.8)	33 (17.6)	13 (17.1)
Ischemic myocardial disease	101 (19)	40 (21.3)	16 (21)
Post-operative	159 (30.2)	49 (26.4)	21 (27.7)
ICU stay time (days)	7 ± 5 [#]	8 ± 5.4 [§]	12.4 ± 4.9
Intervention needed			
Mechanic ventilation (%)	190 (35.9)	74 (39.5)	25 (32.8)
Dialysis (%)	62 (11.7)	23 (12.2)	9 (11.8)
Vasopressor drugs (%)	265 (50)	91 (48.6)	32 (42.1)
TISS-24h	25 ± 8	23 ± 7	24 ± 6
TISS-72h	18 ± 6	16 ± 8	17 ± 5
Communication failure consequences			
Unnecessary phone calls	0.4 ± 0.1 ^{**}	1.3 ± 0.9 [§]	2.3 ± 0.4
Delayed procedures, hours	4 ± 1.2 ^{**}	9 ± 2.3 [§]	14 ± 2
Delayed diag. tests, hours	6.3 ± 2	9 ± 3.1	8 ± 2.2
Delayed antibiotics, hours	2.2 ± 0.4 [#]	3.1 ± 0.3 [§]	9 ± 1.1
Delayed ventilatory weaning, hours	5 ± 2.2 [#]	6.2 ± 1.9 [§]	23 ± 4
Delayed vasopressor, hours	0.5 ± 0.2 [#]	0.3 ± 0.3 [§]	1.3 ± 0.2
Prescription adequacy (%)			
Raised bed head	452 / 478 (94.5) ^{**}	131 / 152 (86.2) [§]	41 / 69 (59.4)
Digestive bleeding prophylaxis	401 / 465 (86.2)	127 / 144 (88.2)	60 / 71 (84.5)
Deep venous thrombosis prophylaxis	455 / 502 (90.6) [#]	114 / 130 (87.6) [§]	39 / 68 (57.3)
ICU mortality (%)	72 (13.6) ^{**}	32 (17.1) [§]	20 (26.3)

Data expressed as mean ± standard deviation or percentage of the group (parenthesis). ICU – intensive care unit; Apache II - Acute Physiology and Chronic Health Evaluation; SOFA - Sequential Organ Failure Assessment. * $p < 0,05$ (DC vs EC); # $p < 0,05$ (DC vs RC); § $p < 0,05$ (EC vs RC).

Table 2 – Multivariate analysis of the variables ‘communication issues’ and its relationship with increased mortality

Variables	Multivariate analysis	RR (95%CI)
Unnecessary phone calls	0.1	1.25 (0.63 - 2.13)
Delayed procedures, hours	0.07	1.51 (0.84 - 1.93)
Delayed antibiotics, hours	0.03	1.83 (1.36 - 2.25)
Delayed ventilatory weaning, hours	0.04	1.63 (1.25 - 2.04)
Delayed vasopressor, hours	0.06	1.35 (0.88 - 1.67)
Raised bed head	0.07	1.34 (0.75 - 2.12)
Deep venous thrombosis prophylaxis	0.03	1.98 (1.43 - 3.12)

RR – relative risk; CI – confidence interval.

DISCUSSION

Our findings show that the assistant physicians and routine ICU doctors communication failure may increase the patients’ mortality, mostly due to delayed antibiotics start, mechanic ventilation weaning, and failure to prescribe deep venous thrombosis prophylaxis.

ICU communication is complicated by the dynamic and constant healthcare professionals flow, patients’ instability and the need of managing therapies, information systems and high-complexity and high-technology devices.⁽⁸⁾ Studies have shown that hierarchical and social factors influence healthcare professionals communication.⁽⁹⁾ Additionally, different professional responsibilities, different communication standards perceptions, and “warlike” relationship between physicians and family members may cause communication failures.^(3,5) It should be emphasized that communication difficulties can also arise from the less experienced team members reluctance to question ‘seniors’ fearing to look incompetent or being reproached.^(5,10-12) Our data have shown significant medical professionals communication failures, generating unnecessary phone calls, significant delays on procedures, vasoactives and antibiotics and ventilatory weaning start, in addition to medical prescriptions inadequacies regarding 30° bed head elevation and deep venous thrombosis drug prophylaxis.

Efforts to minimize this issue, particularly regarding the communication between family members and healthcare professionals have been started.^(2-5,13-17) However, no recommendations were so far developed regarding the healthcare professionals relationship. Our study focus on a current issue, and these findings are worrisome, as they show increased mortality related to the failure to use well known therapeutic measures due to deficient medical communication. Clear evidences emphasized in Interna-

tional guidelines⁽¹⁸⁻²⁰⁾ show that delayed antibiotics in septic patients, delayed mechanic ventilation weaning, and failure to prescribe deep venous thrombosis prophylaxis, increase critically ill patients’ mortality.

Authors^(2-5,7,21,22) have investigated health quality and interdisciplinary communication (physicians versus nurses, physicians versus physiotherapists, nurses versus physiotherapists, among others), or the communication between healthcare professionals and family members for terminality decisions. However, studies on communication issues involving different medical specialties are still missing. Our cohort has shown that in 66.7% (DC=529) of the cases, the communication between the assistant doctors and the ICU doctors was rated as satisfactory, however it is noteworthy that in 9.6% (RC=76) of the cases, there was minimal interaction between physicians directly involved in the patient’s care, which was associated with poorer outcomes.

Some strategies aimed to improve the healthcare professionals’ communication were studied, focusing the ICU patients’ morbidity and mortality reduction. O’Connor et al.⁽²³⁾ provided to the entire ICU staff available wireless e-mail and cell phones communication, and evidenced increased information exchange. Trying to minimize the communication gaps, Storesund et al.⁽²⁴⁾ showed the importance of a multidisciplinary team coordinator to provide that the patient’s care follows one single line, thus avoiding non-uniform or even opposite procedures during the patient’s treatment.

Our study has relevant limitations: (a) this is an observational non-randomized study; (b) the data were not collected on weekends and holidays, certainly causing data losses; (c) the “zero time” to count the delays started from the daily ICU team cases discussion, by the end of the morning; (d) the study gold-standard was defined by the routine doctor’s evaluation, whose observations were almost certainly not always right; (e) the study was conducted in an open ICU, where most of the physicians assisting the patients have no regular participation in the ICU routines. Thus, our results can’t be extrapolated to ICUs where all patient-related decisions are made by routine intensivist doctors.

CONCLUSION

Communication issues between doctors are an issue even in closed ICUs, mainly: (a) during duty shift changes; (b) resident-doctors cases and clinical impressions presentations; and (c) medical consultations in the ICU provided by other medical specialties. Anyway, our find-

ings are relevant, as have shown that the communication between medical professionals may influence the quality of critically ill patients' care.

Contributions: Cassiano Teixeira, Terezinha M. L. Teixeira, Felipe L. D. Neto and Cíntia Roehrig reviewed the literature and wrote the manuscript. Cassiano Teixeira, Sérgio F. M. Brodt, Roselaine P. Oliveira, Felipe L. D. Neto, Cíntia Roehrig and Eubrand S. Oliveira collected data and significantly contributed for the manuscript. Cassiano Teixeira performed the statistical analysis. Cassiano Teixeira assures the accuracy of the presented data.

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RESUMO

Objetivos: A falha de comunicação entre os profissionais de saúde em centros de tratamento intensivo pode estar relacionada ao aumento de mortalidade dos pacientes criticamente doentes. Este estudo teve como objetivo avaliar se falhas de comunicação entre os médicos assistentes e os médicos rotineiros do centro de tratamento intensivo teriam impacto na morbidade e mortalidade dos pacientes críticos.

Métodos: Estudo de coorte incluindo pacientes não consecutivos admitidos no centro de tratamento intensivo durante 18 meses. Os pacientes foram divididos em 3 grupos conforme o hábito de comunicação de seus médicos assistentes com os mé-

dicos rotineiros: CD - comunicação diária da conduta (>75% dos dias); CE - comunicação eventual (25 a 75% dos dias); RC - rara comunicação (<25% dos dias). Foram coletados dados demográficos, escores de gravidade, motivo de internação no centro de tratamento intensivo, tempo de internação no centro de tratamento intensivo e intervenções realizadas nos pacientes. Foram analisadas as conseqüências da falha na comunicação entre os profissionais médicos (atraso na realização de procedimentos, na realização de exames diagnósticos, no início de antibioticoterapia, no desmame do suporte ventilatório e no uso de vasopressores) e inadequações de prescrição médica (ausência de cabeceira elevada, ausência de profilaxia medicamentosa para úlcera de estresse e para trombose venosa profunda) relacionando-as com o desfecho dos pacientes.

Resultados: Foram incluídos 792 pacientes no estudo, sendo agrupados da seguinte maneira: CD (n = 529), CE (n = 187) e RC (n = 76). A mortalidade foi maior nos pacientes pertencentes ao grupo RC (26,3%) comparada aos demais (CD = 13,6% e CE = 17,1%; p < 0,05). A análise multivariada demonstrou que o atraso no início de antibióticos [RR 1,83 (IC95%: 1,36 - 2,25)], o atraso no início do desmame ventilatório [RR 1,63 (IC95%: 1,25 - 2,04)] e a não prescrição de profilaxia para trombose venosa profunda [RR 1,98 (IC95%: 1,43 - 3,12)] contribuíram de forma independente para o aumento de mortalidade dos pacientes.

Conclusão: A falta de comunicação entre médicos assistentes e rotineiros do centro de tratamento intensivo pode aumentar a mortalidade dos pacientes, principalmente devido ao atraso no início de antibióticos e no desmame da ventilação mecânica e a não prescrição de profilaxia para trombose venosa profunda.

Descritores: Comunicação; Unidades de terapia intensiva; Mortalidade; Qualidade da assistência à saúde

REFERENCES

- Dullenkopf A, Rothen HU; Swiss CoBaThICE group. What patients and relatives expect from an intensivist-the Swiss side of a European survey. *Swiss Med Wkly.* 2009;139(3-4):47-51.
- Miller PA. Nurse-physician collaboration in an intensive care unit. *Am J Crit Care.* 2001;10(5):341-50.
- Thomas EJ, Sexton JB, Helmreich RL. Discrepant attitudes about teamwork among critical care nurses and physicians. *Crit Care Med.* 2003;31(3):956-9.
- Sutcliffe KM, Lewton E, Rosenthal MM. Communication failures: an insidious contributor to medical mishaps. *Acad Med.* 2004;79(2):186-94.
- Reader TW, Flin R, Mearns K, Cuthbertson BH. Interdisciplinary communication in the intensive care unit. *Br J Anaesth.* 2007;98(3):347-52.
- Ferreira ABH. Mini Aurélio - o dicionário da língua portuguesa. 7a ed. Curitiba: Positivo; 2009. p. 251.
- Collins SA, Currie LM. Interdisciplinary communication in the ICU. *Stud Health Technol Inform.* 2009;146:362-6.
- Tehrani FT. Automatic control of mechanical ventilation. Part 2: the existing techniques and future trends. *J Clin Monit Comput.* 2008;22(6):417-24.
- Edmondson A. Psychological safety and learning behavior in work teams. *Adm Sci Q.* 1999;44(2):350-83.
- Silva AEBC, Cassiani SHB, Miasso AI, Opitz SP. Problemas de comunicação: uma possível causa de erros de medicação. *Acta Paul Enferm.* 2007;20(3):272-6.
- Manojlovich M, DeCicco B. Healthy work environments, nurse-physician communication, and patients' outcomes. *Am J Crit Care.* 2007;16(6):536-43.
- Cheung W, Milliss D, Thanakrishnan G, Anderson R, Tan JT. Effect of implementation of a weekly multidisciplinary team meeting in a general intensive care unit. *Crit Care*

- Resusc. 2009;11(1):28-33.
13. Reader TW, Flin R, Mearns K, Cuthbertson BH. Developing a team performance framework for the intensive care unit. *Crit Care Med.* 2009;37(5):1787-93. Review.
 14. Lautrette A, Darmon M, Megarbane B, Joly LM, Chevret S, Adrie C, et al. A communication strategy and brochure for relatives of patients dying in the ICU. *New Engl J Med.* 2007;356(5):469-78. Erratum in: *N Engl J Med.* 2007;357(2):203.
 15. Strack van Schijndel RJ, Burchardi H. Bench-to bedside review: leadership and conflict management in the intensive care unit. *Crit Care.* 2007;11(6):234.
 16. Curtis JR, White DB. Practical guidance for evidence-based ICU family conferences. *Chest.* 2008;134(4):835-43.
 17. Azoulay E, Timsit JF, Sprung CL, Soares M, Rusinová K, Lafabrie A, Abizanda R, Svantesson M, Rubulotta F, Ricou B, Benoit D, Heyland D, Joynt G, Français A, Azevedo-Maia P, Owczuk R, Benbenishty J, de Vita M, Valentin A, Ksomos A, Cohen S, Kompan L, Ho K, Abroug F, Kaarlola A, Gerlach H, Kyprianou T, Michalsen A, Chevret S, Schlemmer B; Conflicus Study Investigators and for the Ethics Section of the European Society of Intensive Care Medicine. Prevalence and factors of intensive care unit conflicts: the conflicus study. *Am J Respir Crit Care Med.* 2009;180(9):853-60.
 18. Cook DJ, Crowther MA, Douketis J; VTE in the ICU Workshop Participants. Thromboprophylaxis in medical-surgical intensive care unit patients. *J Crit Care.* 2005;20(4):320-3. Review.
 19. Tobin MJ, Lagui F. Weaning from mechanical ventilation. In: Tobin MJ. *Principles and practice of mechanical ventilation.* 2nd ed. New York: McGraw-Hill; 2006. p.1185-220.
 20. Dellinger RP, Levy MM, Carlet JM, Bion J, Parker MM, Jaeschke R, Reinhart K, Angus DC, Brun-Buisson C, Beale R, Calandra T, Dhainaut JF, Gerlach H, Harvey M, Marini JJ, Marshall J, Ranieri M, Ramsay G, Sevransky J, Thompson BT, Townsend S, Vender JS, Zimmerman JL, Vincent JL; International Surviving Sepsis Campaign Guidelines Committee; American Association of Critical-Care Nurses; American College of Chest Physicians; American College of Emergency Physicians; Canadian Critical Care Society; European Society of Clinical Microbiology and Infectious Diseases; European Society of Intensive Care Medicine; European Respiratory Society; International Sepsis Forum; Japanese Association for Acute Medicine; Japanese Society of Intensive Care Medicine; Society of Critical Care Medicine; Society of Hospital Medicine; Surgical Infection Society; World Federation of Societies of Intensive and Critical Care Medicine. Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock: 2008. *Crit Care Med.* 2008;36(1):296-327. Erratum in: *Crit Care Med.* 2008;36(4):1394-6.
 21. Moritz RD. Como melhorar a comunicação e prevenir conflitos nas situações de terminalidade na unidade de terapia intensiva. *Rev Bras Ter Intensiva.* 2007;19(4):485-9.
 22. LeClaire MM, Oakes JM, Weinert CR. Communication of prognostic information for critically ill patients. *Chest.* 2005;128(3):1728-35.
 23. O'Connor C, Fridrich JO, Scales DC, Adhikari NK. The use of wireless e-mail to improve healthcare team communication. *J Am Med Inform Assoc.* 2009;16(5):705-13.
 24. Storesund A, McMurray A. Quality of practice in an intensive care unit (ICU): a mini-ethnographic case study. *Intensive Crit Care Nurs.* 2009;25(3):120-7.