

Title: Does acute type A aortic dissection (ATAAD) management on overtime working hours have an impact on in-hospital neurological outcomes? A single-center retrospective study

Brief title: Impact of overtime working hours on neurological outcomes after surgery for ATAAD

Author(s): Borceux J., Jacobs Sariyar A., Grégoire A., Momeni M., Khalifa C.

Hospital/Institute: Cliniques universitaires Saint-Luc
Avenue Hippocrate, 10
1200 Brussels (Belgium)

Objective: To evaluate whether performing surgery for ATAAD during overtime working hours had an impact on in-hospital neurological outcomes in our institution over a 15-year period of time.

Background: ATAAD is a life-threatening surgical emergency with high rates of morbidity and mortality.¹ Its management requires the constant availability of a coordinated expert team. Overtime working hours might be associated with difficulties in concentration, dexterity or less dedicated human resources.² In the context of ATAAD, previous studies showed conflicting results.³

Methods: All patients admitted in our hospital to undergo surgery for ATAAD between 2002 and 2017 were included. Patients were classified into two groups according to two working periods of time: “daytime” [8 a.m.-6 p.m. from Monday to Friday] and “overtime” (either [6 p.m.-8 a.m. from Monday to Friday], or 24 hours during week-ends). The time of admission in the operating room dictated to which category the patient belonged. A systematic research of patients’ preoperative characteristics, intraoperative and postoperative clinical data was conducted. The primary outcome was the difference in in-hospital neurological complications incidences. Secondary outcomes were the differences in in-hospital and 90-day mortality rates. A Mann-Whitney U test was used to compare continuous variables between both groups, and a Pearson Chi-square test was used to compare categorical variables. A p-value < 0.05 was considered statistically significant. (Comité d’Ethique Hospitalo-Facultaire, Brussels, ref. 2018/05JUI/242)

Results: Over 15 years, 230 patients underwent surgery for ATAAD in our hospital. Due to missing files, we limited our analyses to 131 patients. Among them, 74 patients were operated during daytime, and 56 patients on overtime hours. Some characteristics of the population are listed in the Table 1. Both groups were similar regarding preoperative background, intraoperative care, postoperative length of stay and re-intervention. There was a higher number of patients presenting with at least one major complication related to ATAAD during daytime (p=0.036). Significant hemodynamic instability was also more frequent during daytime (p=0.028). 75 patients (57.3%) suffered from neurological complications, with no statistically significant difference between working periods. There was no statistically significant difference regarding in-hospital mortality. However, 90-day mortality was significantly higher in the daytime group.

Conclusions: Overtime management of ATAAD, in our institution, was not accompanied by an adverse effect on in-hospital neurological outcomes. Our results also showed a higher 90-day mortality rate in patients operated during the day. This might be partially related to the higher incidence of preoperative complications related to ATAAD and the greater hemodynamic instability encountered in this group.

Table 1 Characteristics of the population (All continuous variables are expressed as medians (25th-75th percentiles). All categorical variables are expressed as numbers (%). Patients with available data are mentioned between brackets).

Variables	Daytime (n=74)	Overtime (n=57)	p
Age (y)	65 (58-75)	65 (52-72)	0.635
Gender, male	53 (71.6)	32 (56.1)	0.066
Hypertension	54 (n=69) (78.3)	38 (n=55) (69.1)	0.246
Baseline GFR (ml.min⁻¹)	65 (54-82)	64.5 (50-81)	0.177
Redo surgery	12 (16.2)	7 (12.3)	0.526
Operating time (min)	378 (n=71) (315-480)	342 (n=56) (302-417)	0.085
Circulatory arrest time (min)	32 (n=72) (21-50)	33 (n=57) (24-45)	0.455
Hospital length of stay (d)	13 (n=66) (7-24)	12 (n=54) (6-22)	0.323
Neurological complications	46 (62.2)	29 (50.9)	0.196
<i>Transient neurological dysfunction (n=26)</i>	13 (28.3)	13 (43.3)	0.176
<i>Permanent neurological dysfunction (n=50)</i>	33 (73.3)	17 (26.7)	0.134
In-hospital mortality	22 (29.7)	9 (15.8)	0.063
<i>Neurological cause (n=17)</i>	14 (63.6)	3 (33.3)	0.124
<i>Non-neurological cause (n=14)</i>	8 (34.8)	6 (66.7)	0.102
90-day mortality	23 (31.1)	9 (15.8)	0.043

References:

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