

P2510 Alterations in markers of infection and inflammation after surgery in hospitalised patients

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Background: Post-surgical stress is an important clinical problem that may be influenced by factors such as tissue damage, type of surgery and anesthesia, preoperative anxiety, hypoxia, hypothermia, hypoglycemia, dehydration, pain, hemorrhage or infection. The identification of biochemical alterations related to stress in the postoperative period can provide with tools to facilitate decision making, reduce hospitalization and improve the rate of cure. The development of infections after surgery is frequent, and recent studies suggested that the measurement of serum paraoxonase-1 (PON1) and several indices of inflammation may provide with useful information on the infected patient status. The aim of the present study has been to investigate the influence of surgical procedures on these parameters.

Materials/methods: We studied the post-operative serum levels of PON1 lactonase and paraoxonase activities, PON1 concentration, chemokine (C-C motif) ligand 2 (CCL2), C-reactive protein (CRP) and procalcitonin (PCT) in 115 hospitalized patients who underwent surgery. We also studied 170 hospitalized patients who did not receive surgery, and 404 healthy volunteers. Their medical records were also reviewed, and pertinent demographic data, comorbidities, bacteriologic and therapeutic data were recorded.

Results: All patients, both those who were operated on and those who did not, had a higher inflammatory status than healthy individuals, with higher CCL2, CRP and PCT levels, and lower PON1 activities (Table 1). The number of days after surgery was directly correlated with serum CRP ($p = 0.002$) concentrations, and inversely with serum PON1 paraoxonase ($p = 0.014$) and lactonase activities ($p = 0.036$). The duration of surgery was directly correlated with serum CRP ($p = 0.003$) concentrations, and inversely with serum lactonase activities ($p = 0.004$). Regional anesthesia was associated with higher PON1 activities and lower CRP concentrations than general anesthesia.

Conclusions: This study highlights the intertwined relationships between surgery, inflammation and infection in hospitalized patients, which can contribute to a better understanding of the biochemical mechanisms underlying surgery stress.

Table 1
Demographic, clinical and biochemical variables of the patients and the control group

Variable *	Control group (n = 404)	Surgery no (n = 170)	Surgery yes (n = 115)
Age, years	46 (35 – 60)	68 (56 – 78) ^b	70 (60 – 77) ^b
Gender, women	175 (43.3)	83 (48.8)	74 (20.9) ^c
Smoking	73 (18.1)	28 (16.5)	22 (15.1)
Alcohol intake	64 (15.8)	25 (14.7)	28 (24.3)
Hypertension	NA	105 (61.8)	74 (64.3)
Diabetes mellitus	NA	67 (39.4)	28 (24.3) ^c
Dyslipidemia	NA	69 (40.6)	39 (33.9)
Ischemic heart disease	NA	32 (18.8)	16 (13.9)
Renal insufficiency	NA	30 (17.6)	16 (13.9)
Ictus	NA	21 (12.4)	4 (3.5) ^c
Chronic obstructive pulmonary disease	NA	26 (15.3)	19 (16.5)
Concomitant acute infection	NA	75 (44.1)	14 (12.2) ^c
Concomitant chronic infection	NA	2 (1.2)	0 (0)
PON1 concentration, mg/L	96.5 (72.2 – 135.9)	109.7 (66.3 – 153.6)	94.7 (62.4 – 145.6)
Paraoxonase activity, U/L	278.7 (214.9 – 372.5)	205.6 (161.9 – 270.2) ^b	222.4 (182.1 – 278.4) ^b
Lactonase activity, U/L	5.5 (4.5 – 6.5)	2.9 (1.2 – 3.6) ^b	3.1 (2.5 – 3.9) ^{bc}
chemokine (C-C motif) ligand 2, ng/L	138.5 (112.0 – 170.6)	195.2 (149.2 – 261.3) ^b	193.8 (162.9 – 247.2) ^b
Procalcitonin	<0.04	37.7 (19.5 – 69.8)	29.6 (10.5 – 75.2) ^b
C-reactive protein, mg/L	1.3 (0.4 – 2.8)	18.9 (6.0 – 45.7) ^b	29.7 (5.8 – 59.8) ^d

* Quantitative variables are shown as medians and interquartile ranges (in parenthesis). Qualitative variables are shown as number of cases and percentages (in parenthesis). DL, detection limit of the assay; NA, not applicable; PON1, paraoxonase-1; ^b P < 0.01; ^c P < 0.001; ^d P < 0.001, with respect to the control group; ^e P < 0.05; ^f P < 0.01; ^g P < 0.001, with respect to patients that did not receive surgery.

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