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Plasma-Sulfate–Conjugated Catecholamines during Anesthesia

To the Editor:—Recent reports in the Journal have examined the effects of anesthetics on adrenergic response during surgery.[1,2] Responses were evaluated by measuring variations in concentrations of plasma norepinephrine and epinephrine. However, the methods used in these studies measured only free plasma catecholamines, whereas, in humans, 70–80% of total plasma catecholamines are sulfate conjugated.[3] Thus, we performed a study in seven ASA class I or II patients (aged 25–69 years) to delineate variations in sulfate-conjugated catecholamines during anesthesia.

In all cases, induction was achieved with thiopental, 5 mg/kg, and succinylcholine, 1 mg/kg, followed by nitrous-oxide-halothane for maintenance. Radial artery blood samples were obtained simultaneously before induction of anesthesia (T1) (20 min after intraarterial insertion of catheter), 1 min after tracheal intubation (T2), and 1 min after skin incision (T3) for measurement of total and free norepinephrine (NE) and epinephrine (E) levels, using a radio-enzymatic assay method. Sulfate-conjugated catecholamines were calculated from these data by subtraction.[3]

TABLE 1.

	T1	T2	T3
Total NE pg/ml	982 ± 174	1,031 ± 180	1,033 ± 190
Free NE pg/ml	185 ± 32	275 ± 48†	305* ± 74
Sulfate-conjugated NE in per cent	79.9 ± 3	71.2* ± 3.7	69.3* ± 2.3
Total E pg/ml	517 ± 188	441 ± 168	366 ± 171
Free E pg/ml	64 ± 15	29† ± 4	32† ± 6
Sulfate-conjugated E in per cent	82.4 ± 4.1	89.5† ± 2.1	89.6† ± 2.3

Values are mean ± SE.
* $P < 0.01$ *versus* T1 (analysis of variance).
† $P < 0.05$.

As noted in other studies, free NE increased during nociceptive stimulations (table 1); free E levels decreased. Total NE and E levels did not change. The percentage of sulfate-conjugated NE decreased significantly, while the percentage of sulfate-conjugated E increased.

Sulfate-conjugated catecholamines are usually thought to be of minor importance in the regulation of circulation in humans except in some situations.[4] The role they play in anesthetized patients currently is under study.

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