

## From Brazil....

### ADRIAMYCIN CARDIOTOXICITY, BEZOLD-JARISCH REFLEX OR BOTH?

ADRIANO BECHARA DE SOUZA HOBAIKA \*

Sir,

I have read with interest the work of Chander *et al.* which reports the case of a patient receiving adriamycin who presented pulseless electrical activity during anesthetic procedure<sup>1</sup>. Authors have reported that the patient presented a hypertensive crisis during surgery treated with an intravenous infusion of nitroglycerin. Two minutes later, the patient presented bradycardia, hypotension and pulseless electrical activity.

The case discussion is very interesting and emphasizes adriamycin cardiotoxic properties and the risk factors present in the patient which may aggravate the toxicity. Nevertheless, due to a clear time relationship between the beginning of nitroglycerin infusion and the cardiovascular collapse, Bezold-Jarisch reflex cannot be discarded. This reflex involves chemical or mechanical stimulation of receptors of left ventricle wall that activate unmyelinated sensory nerve fibers that pass via the vagus nerve to the brainstem. The efferent response is an increased parasympathetic tonus with bradycardia, hypotension and vasodilation<sup>2</sup>. In this patient, the activation mechanism of Bezold-Jarisch reflex may have been the redistribution of blood flow from the central to the peripheral circulation induced by nitroglycerin administration. This relative hypovolemic state may have activated the left ventricle mechanoreceptors determining an increased parasympathetic tonus and cardiovascular collapse. Experimental data have shown that chronic administration of adriamycin triggers a decreased physiological response of baroreceptors which occur early, even

From Santa Casa de Belo Horizonte.

\* MD, Co-Responsible for the Anesthesiology Teaching and Training Center Santa Casa de Belo Horizonte.

Corresponding author: Adriano BS Hobaika, Av. Fransisco Sales 1111. Belo Horizonte-Minas Gerais-Brazil, CEP: 30150-221. E-mail: hobaika@globo.com.

before heart failure is manifested<sup>3,4,5,6</sup>. In rats treated with adriamycin, the heart rate response to changes in the arterial pressure induced by nitroglycerin and phenylephrine injection was greatly diminished and there is a decreased inotropic response to beta-adrenoceptor stimulation<sup>6</sup>. In the case described by the authors, the treatment with adriamycin may have contributed to exacerbate Bezold-Jarisch reflex symptoms as it reduces baroreceptors reflexes and there was no compensatory reflex tachycardia.

## References

1. CHANDER B, BHAGAT H, PRABHAKAR H: Adriamycin induced pulseless electrical activity and cardiovascular collapse during general anesthesia for ventriculo-peritoneal shunt insertion. *Middle East Journal of Anesthesiology*; 2008, 19:841-46.
2. KINSELLA SM, TUCKEY JP: Perioperative bradycardia and asystole: relationship to vasovagal syncope and the Bezold-Jarisch reflex. *Br J Anaesth*; 2001, 86:859-68.
3. RABELO E, DE ANGELIS K, BOCK P, ET AL: Baroreflex sensitive and oxidative stress in adriamycin-induced heart failure. *Hypertension*; 2001, 38:576-80.
4. BOCHERENS-GADIENT AS, QUAST U, NUSSBERGER J, ET AL: Chronic adriamycin treatment and its effects on the cardiac  $\beta$ -adrenergic system in the rabbit. *J Cardiovasc Pharmacol*; 1992, 19:770-78.
5. SANO N, WAY D, MCGRATH BP: Renal norepinephrine spillover and baroreflex responses in evolving heart failure. *Am J Physiol*; 1990, 258:F1516-22.
6. GORDETSKAYA EA, DUGIN SF, GLOIKOV MA, ET AL: The cardiac contractile function and hemodynamic control in rats after chronic adriamycin treatment. *Can J Physiol Pharmacol*; 1990, 68:211-15.