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Title: ACUTE OXYGEN INDUCED AMIODARONE PULMONARY TOXICITY AFTER GENERAL ANESTHESIA
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Amiodarone may be indicated in the treatment of tachyarrhythmias and is frequently included in the management of cardiac transplant candidates. Adverse effects have been documented including cardiac, hepatic and pulmonary toxicity. The incidence of amiodarone pulmonary toxicity (APT) is estimated at 5-15% with a reported mortality rate of 5-10%. We noted an increased incidence of acute pulmonary complications following general anesthesia in patients receiving amiodarone when exposed to 100% oxygen.

A retrospective review was conducted of twenty patients who received general anesthesia for automatic internal cardiac defibrillator (AICD) placement or cardiac transplantation. Medications were noted. Intraoperative FiO_2 was ascertained from the anesthetic record. Progress notes and chest radiographs were reviewed for evidence of pulmonary complications defined as extensive postoperative radiographic infiltrates accompanied by a widened A-a gradient.

Of twenty patients, twelve had AICD placement and eight underwent cardiac transplantation. 55% (11) were receiving amiodarone at the time of surgery. 73% (8) of 11 patients experienced pulmonary complications postoperatively. Among patients not receiving amiodarone the pulmonary complication rate was 22%. The incidence of pulmonary complication in patients on amiodarone and exposed to 100% oxygen is 86% versus 50% among patients on amiodarone but not exposed to 100% oxygen (see chart). Of the two patients receiving amiodarone but not exposed to FiO_2 greater than 50%, one exhibited symptoms of ARDS with positive blood cultures and the other had pulmonary edema secondary to congestive heart failure that resolved with diuresis. In each of the six patients on amiodarone and exposed to 100% oxygen the onset of symptoms was 36 to 72 hours postoperatively. Underlying congestive heart failure, systemic infection and obvious aspiration were eliminated in five of the six patients. The sixth case had candida sepsis confirmed by positive blood cultures that was accompanied by ARDS clinically. In three cases histologic exam revealed foamy histiocytes, consistent with APT. Of interest are two cases where patients underwent AICD placement with double lumen endotracheal tubes. During single lung ventilation 100% oxygen was delivered. Postoperatively, diffuse infiltrates were noted unilaterally on chest X-ray on the side exposed to 100% oxygen.

We postulate that amiodarone in the presence of high inspired oxygen tension enhances the production of free oxygen radicals resulting in alveolar damage. On the basis of these cases we suggest FiO_2 be kept to a minimum in patients receiving amiodarone and undergoing general anesthesia.

Incidence of Pulmonary Complication
Related to Amiodarone and FiO_2

	AMIODARONE	NO AMIODARONE
$FiO_2 > 50\%$	86% (6 of 7)	25% (2 of 8)
$FiO_2 < 50\%$	50% (2 of 4)	0% (0 of 1)

References:

Herndon JC, et al. Postoperative Unilateral Amiodarone Pulmonary Toxicity. Anesthesiology, publication pending.

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LAPAROSCOPY ALLOWS FOR REDUCTION OF THE ACUTE PHASE REACTION DEVELOPING AFTER CHOLECYSTECTOMY. J. Joris¹, I. Cigarini¹, M. Legrand², P. Franchimont³, De Groote⁴, M. Lamy¹
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Recently, endoscopic surgery was introduced for cholecystectomy in uncomplicated cholelithiasis (1-2). Laparoscopic cholecystectomy has many advantages, the major being a shortened hospital stay (1-2). The better and sooner recovery and feeling of well-being described after laparoscopic cholecystectomy as compared to laparotomy should reflect a reduction of the acute phase reaction (APR) responsible for post-operative fatigue. However no studies have provided biochemical evidence for this phenomenon. This controlled study explored and compared the APR after cholecystectomy under laparoscopy and laparotomy.

After approval of our institution ethical committee, 29 fully informed patients scheduled for elective cholecystectomy were included in the study: 16 had laparotomy and 13 had laparoscopy. The same anesthesia was given to all patients: isoflurane in 50% N_2O/O_2 . The APR was characterized by 4 different parameters: glycemia (g/lit), leucocytosis (10/mm³), C reactive protein (CRP) the most sensitive acute phase protein (mg/lit) and body temperature (T°). Neuroendocrinologic stimulation and inflammatory mediators release (cytokines) that mediate the APR were also explored. Cortisol (µg/lit), epi- and norepinephrine (HPLC: ng/lit) were measured. Interleukin-6 (IL-6) (pg/ml), the most efficient hepatic stimulator of acute phase proteins production, was measured by immunoradiometric assay (Medgenix, Fleurus Belgium). Blood samples were collected preop, 4H postop, on days 1 and 2 at 8H. Data expressed as mean ± SEM were analyzed by Zerbe's method and Student's t-test.

The increase of the 3 biological markers of the APR as well as T° was significantly (p<0.01) smaller and shortened after laparoscopy (table 1-2). Cortisol and catecholamines levels of the 2 groups rose after surgery but did not differ significantly. IL-6 levels were already significantly less elevated in the laparoscopy group at the 4H time point (table 2). Moreover, a statistical correlation exists between CRP and IL-6 (p<0.01).

table 1	GLUCOSE		LEUCOCYTES	
	TOMY	SCOPY	TOMY	SCOPY
PRE	1.00±0.03	0.95±0.05	7.3±0.6	6.7±0.6
4H	1.45±0.17	1.13±0.10	13.0±1.0	11.1±0.9
D1	1.21±0.07	0.95±0.05*	10.2±0.5	8.0±0.5*
D2	1.08±0.10	0.91±0.03	9.5±0.7	6.5±0.4*

table 2	CRP		IL-6	
	TOMY	SCOPY	TOMY	SCOPY
PRE	5.4±2.2	3.9±0.5	7.2±2.6	2.9±2.3
4H	8.1±3.9	5.2±1.6	48.7±7.2	23.7±5.3*
D1	46.8±8.1	29.1±5.6*	68.9±11.6	10.7±3.6*
D2	85.9±10.1	38.9±4.0*	35.9±6.4	4.5±1.6*

Duration of postop IV infusion, postop fasting and hospital stay were significantly (p<0.01) shorter after laparoscopy.

This study demonstrates that laparoscopy allows for reduction of the acute phase reaction developing after cholecystectomy. Whereas the neuroendocrine response does not appear to be affected by laparoscopy, IL-6 release is profoundly reduced after laparoscopy. Consequently, postop IV infusion, fasting and hospital stay were shortened.

- Ann Surg 1990; 211: 60-62.
 - Am J Surg 1990; 160: 485-487.
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