DOES INTRAOPERATIVE HYPEROXIA INCREASE CARDIOVASCULAR COMPLICATIONS AFTER COLORECTAL SURGERY?

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BACKGROUND AND GOAL OF THE STUDY

In 2016 the World Health Organization strongly recommended intraoperative high inspired oxygen fraction (>80%) to reduce the incidence of surgical site infection (SSI)¹.

However some authors warned about the potential increase of cardiovascular complications when applying this therapy².

The goal of the study was to audit if 80% FiO₂ administered increased cardiovascular complications when compared to standard therapy (<50% FiO₂).

MATERIAL AND METHODS

We reviewed the patients scheduled for elective oncologic colorectal surgery in 2015.

We divided them according to the intraoperative FiO₂ received into two groups: Hyperoxia Group (HG) (FiO₂>80%) and Control Group (CG) (FiO₂<50%).

We recorded demographic data (gender, age, ASA status and preoperative anaemia), previous cardiovascular disease (ischaemic heart disease, congestive heart failure and arrhythmia) and coronary risk factors (hypertension, obesity, diabetes, dyslipidemia and smoking). We also recorded intraoperative data (type and duration of surgery).

We reviewed medical charts to determine the incidence of acute coronary syndrome (myocardial infarction or angina pectoris) and other cardiovascular complications (arrhythmia, congestive heart failure or stroke) in the immediate postoperative period (up to 30 days) and in the delayed postoperative period (up to 2 years).

Statistical analysis: Fisher test to compare demographic data and also the incidence of the complications between the 2 groups. P value <0.05% was considered as significant.

RESULTS AND DISCUSSION

We included 100 patients divided between HG (n=53) and CG (n=47). No differences were found between groups according to demographic or intraoperative data, preoperative cardiovascular disease or coronary risk factors. *Table 1.*

	HYPEROXIA GROUP (n= 53)	CONTROL GROUP (n=47)
Sex (male)	58%	55%
Age (years)	70 ± 13	72 ± 12
ASA I:II:III:IV	5% : 63% : 29% : 3%	4% : 60% : 30% : 6%
Previous cardiovascular disease	30%	38%
Ischaemic heart disease	11%	14%
Coronary Risk Factors		
Hypertension	60%	70%
Diabetes Mellitus	26%	23%
Dyslipidemia	25%	18%
Current Smoking	38%	40%
BMI ≥ 30	27%	30%
≥ 3 Risk factors	24%	30%
Pre-operative haemoglobin (g/dL)	12.7 ± 2	12.0 ± 2
Diagnosis: cancer	93%	98%
Types of surgery		
Right hemicolectomy	42%	45%
Rectal resection	19%	21%
Sigma resection	26%	23%
Others (colectomy...)	13%	11%
Laparoscopic surgery	72%	65%
Duration of surgery (min)	250 ± 73	236 ± 84
Vasoactive drugs		
Ephedrine (mg)	9 ± 4	10 ± 6
Phenylephrine (mcg)	210 ± 100	196 ± 120
Perioperative blood transfusion	18%	24%

Table 1. Demographic and perioperative data

In the 30-days postoperative period, the incidence of acute coronary syndrome was 0% in HG and 4.2% (n=2) in CG. Incidence of other cardiovascular complications was 2% in HG and 8.5% in CG. No significant differences were observed.

Figure 1. 30-day complications comparison between two groups

In the 2-year postoperative period, the incidence of acute coronary syndrome was 3.7% in HG and 2% in CG. The incidence of other cardiovascular complications was 17% vs 13% respectively. No significant differences were observed between two groups.

Figure 2. 2-year complications comparison between two groups

CONCLUSIONS

Immediate or delayed cardiovascular complications doesn't seems to increase when applying hyperoxia to patients scheduled to elective colorectal surgery.

REFERENCES

1. Global Guidelines for the Prevention of Surgical Site Infection. Geneva: World Health Organization; 2016.
2. Fonnes S et al. Perioperative hyperoxia - Long-term impact on cardiovascular complications after abdominal surgery, a post hoc analysis of the PROXI trial. Int J Cardiol. 2016 Jul 15;215: 238-43.