Vasoplegic effects of general anaesthetics (xenon, sevoflurane and isoflurane) in elderly patients during ophthalmic surgery

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In the conduct of general anaesthesia cardiodepressant effects of anaesthetics often have a critical result in elderly patients. We have considerable experience in conducting xenon anaesthesia in ophthalmic operations. The **aim of the study** was to compare the course of anaesthesia in patients older than 50 years with concomitant pathology under conditions of general anaesthesia.

Anaesthesia technique	1 group (Xe), n=27	2 group (Sev), n=24	3 group (Iso), n=23
Premedication:	ataractics on the eve of surgery, diazepamum 5 mg i.v. in the operating room		
Induction:	i.v.: propofolum 1.5-2 mg/kg + fhentanylum - 2 µg/kg or by inhaling the sevoflurane		
Installation of laryngeal mask. Spontaneous breathing with flow support. Monitoring indices of CO ₂ , MV, respiratory volume. If necessary, the ventilator was connected.			
Anaesthesia maintaining:	Xenon («Xena-010» apparatus, closed reversible breathing circuit): denitrogenisation, time of xenon saturation (8±4 min), target concentration Xe 48-55% (0.7-1.0 MAC)	Sevoflurane (Dreger Fabius, 0.8-1.0 MAC, O ₂ 0.4-0.8 l/min)	Isoflurane (Dreger Fabius, 0.8-1.0 MAC, O ₂ 0.4-0.8 l/min)
Analgesia:	Phentanylum 3 µg/kg per hour

Materials and Methods: There was carried out a prospective comparative study during laryngeal mask combined anaesthesia using xenon (Xe) - group 1, sevoflurane (Sev) – group 2, and isoflurane (Iso) – group 3 in ophthalmic surgery (vitreoretinal interventions, keratoplasty, eviscerations, strabismus correction, ptosis). An average age of patients in Xe group was 65±8, Sev - 58±9, Iso - 59±9 years. Accompanying pathology (hypertensive disease, ischemic heart disease, diabetes mellitus), duration and character of the operations in the groups were comparable.

There were investigated: the indications of hemodynamics and oxygenation (the initial data, in 20, 40, 60 min), infusion volume and recovery time. *Statistic study:* descriptive analysis (M±St.Dev.), U-cr. Mann-Whitney, x².

Results of research: The initial data between the groups differed insignificantly. In 20 min of anaesthesia *total peripheral vascular resistance* does not change in the group 1 (Xe) and significantly decreases in groups 2 (Sev) and 3 (Iso) - by 27 and 48%, respectively (p<0.05). To stabilize hemodynamics in groups of halogenated anaesthetics, a relatively larger amount of infusion was required than in the xenon group, and the use of inotropic drugs, which is unsafe in elderly patients with cardiac pathology.

Discussion: Our results confirm the findings made by Devroe S. et al (2015): xenon has minimal haemodynamic side effects when compared to volatile or intravenous anaesthetics.

Researched clinical indices	1 (Xe)	2 (Sev)	3 (Iso)
I.V. infusion NaCl 0.9%, l (M±St.Dev.)	1.0±0.4	1.4±0.5	1.6±0.4*
Infusion of inotropes (%)	0	5**	10**
The recovery time of consciousness, min (M±St.Dev.)	5±1	17±2***	18±3***

* - p(1-3)<0.05; **x² (1-2,3)<0.05; *** - p (1-2,3)<0.005

Conclusions: Xenon is an anaesthetic of choice for general anaesthesia in elderly patients with concomitant pathology in ophthalmic surgery. The course of anaesthesia is characterized by stable hemodynamics; the recovery from anaesthesia is quick and comfortable.

*Devroe S. et al. *Trials* (2015) DOI 10.1186/s13063-015-0587-3