IMMUNOHISTOCHEMICAL EXPRESSION OF Ki-67 AND CD56 IN THE RAT SMALL INTESTINE AFTER LOCAL AND GENERAL ANAESTHESIA AND GRAPE-SEED-OIL BIOCORRECTION

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Relevance. Anaesthesia-related injury of the intestinal mucosa affects both epithelial renewal and local immune surveillance. Proliferation marker Ki-67 and the NK/neuroendocrine marker CD56 (NCAM) allow these two processes to be quantified objectively.

Aim. To evaluate Ki-67 and CD56 expression in the rat small intestine after local and general anaesthesia and to assess their recovery following grape-seed-oil biocorrection.

Materials and methods. Immunohistochemistry for Ki-67 and CD56 was performed on duodenal, jejunal and ileal sections of control, anaesthesia and biocorrection groups. DAB chromogen was used, and the labelling index (immunopositive cells per ≥500–1000 counted cells) was determined automatically in QuPath 0.4.0.

Results. In the control group Ki-67 ranged 28.5–31.7 % and CD56 38.5–41.2 %. Both markers fell markedly after anaesthesia. Ki-67 decreased 2.33-fold (3 months) and 2.5-fold (9 months) after local anaesthesia, and 3.14-fold and 2.31-fold, respectively, after general anaesthesia, confirming a stronger inhibitory action of propofol. CD56 remained relatively preserved after local anaesthesia (27.8–31.4 %) but collapsed after general anaesthesia, with expression of only 5.3–8.1 % in most samples.

Grape-seed-oil biocorrection produced a clear positive shift. Ki-67 recovered to 18.2–23.1 % after local and to 13.5–15.2 % after general anaesthesia — an approximately 1.8–2.0-fold restoration in 3-month animals — while CD56 rose about 1.4-fold; recovery was more modest (1.2–1.5-fold) in the 9-month group. Reactivated expression localised to crypts and goblet cells.

Group	Ki-67, %	CD56, %
Control	28.5–31.7	38.5–41.2
Local anaesthesia	12.3–14.5	27.8–31.4
General anaesthesia	10.1–12.4	5.3–8.1
Biocorrection (local)	18.2–23.1	≈ +1.4×
Biocorrection (general)	13.5–15.2	partial

Conclusion. Ki-67 and CD56 are informative markers of anaesthesia-induced suppression of epithelial proliferation and local immune activity in the small intestine; grape-seed-oil biocorrection partially restores both, most effectively after local anaesthesia and in younger animals.