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#### JUSTIFICATION OF THE EFFECTIVENESS OF SODIUM SELENITE FOR CORRECTING CHANGES IN THE MORPHOMETRIC PARAMETERS OF BONE REGENERATE CAUSED BY PROLONGED ADMINISTRATION OF TARTRAZINE

E. S. Novik<sup>1</sup>, V. N. Morozov<sup>1</sup>

<sup>1</sup>Belgorod National Research University, Belgorod, Russia

**Introduction:** Tartrazine is a synthetic dye that is widely used in the food and pharmaceutical industries. It is known that tartrazine can cause DNA damage, induce the development of oxidative stress in cells, and lead to their apoptosis, but the issue of pharmacological correction of this effect remains poorly studied.

The aim of the study is to justify the effectiveness of sodium selenite as a corrector of adverse changes in the histological structure bone regenerate caused by prolonged administration of tartrazine.

**Methods:** In group I, white sexually mature male rats received a physiological solution intragastrically for 60 days, and on the 61st day, a fracture of the tibia was modeled by creating a through defect in the proximal metaphysis. In group II, under similar conditions, a tartrazine solution was administered at a dose of 750 mg/kg body weight, and in group III, sodium selenite was additionally administered intramuscularly at a dose of 40 mcg/kg body weight. Measurements of the morphometric parameters of the bone regenerate forming in the tibia were conducted on days 3, 10, 15, 24, and 45 after the operation using the computer program NDP.view2. Statistical processing of the data from the control and experimental groups was carried out in the «JASP» program.

**Results:** In animals of group II, a decrease in the area of woven bone and lamellar bone was observed by 36.69% and 53.72% on day 10, by 28.79% and 24.56% on day 15, by 24.13% and 22.00% on day 24 ( $p < 0.05$  in all cases), and by 9.92% ( $p > 0.05$ ) and 13.95% ( $p < 0.05$ ) on day 45. In

group III, the corrective effect of sodium selenite was recorded on day 24: an increase in the area of woven bone and lamellar bone of the bone regenerate by 23.34% and 19.07% ( $p < 0.05$ ).

**Conclusion:** The introduction of sodium selenite at a dose of 40 mcg/kg against the background of 60 days of exposure to tartrazine at a dose of 750 mg/kg reduces the severity of changes in the morphometric parameters of bone regenerate the areas of woven and lamellar bones on the 24th day of the experiment.

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#### DIFFERENTIAL EFFECTS OF OSTEOPOROSIS THERAPIES ON TRABECULAR BONE SCORE: A SYSTEMATIC REVIEW AND META-ANALYSIS

E. Shevroja<sup>1</sup>, D. Vieira<sup>1</sup>, E. Gonzalez Rodriguez<sup>1</sup>, O. Lamy<sup>1</sup>, K. Hind<sup>2</sup>, D. Hans<sup>1</sup>

<sup>1</sup>Lausanne University Hospital, Lausanne, Switzerland; <sup>2</sup>Faculty of Health and Medicine, Lancaster University, Lancaster, United Kingdom

**Background:** Bone mineral density (BMD) measured by DXA is widely used for fracture risk assessment and for monitoring response to osteoporosis therapy. BMD is also an accepted imaging endpoint in osteoporosis clinical trials, supported by recent regulatory decisions recognising DXA-derived BMD as a valid surrogate for fracture outcomes. Trabecular bone score (TBS), derived from the same DXA image, independently predicts fracture and provides complementary information on bone microarchitecture. As imaging-based endpoints continue to play a central role in the evaluation of osteoporosis therapies, a clearer understanding of how different pharmacological treatments influence TBS is increasingly important. In this context, TBS may offer additional insight into treatment effects on bone quality beyond changes in BMD alone

**Methods:** A systematic review and meta-analysis were conducted according to a protocol registered in PROSPERO. PubMed, Embase, Web of Science, CENTRAL, publisher platforms, and clinical trial registries were searched. Eligible studies included men or women aged  $\geq 40$  years with TBS assessed by DXA, evaluating pharmacological osteoporosis therapies compared with no treatment or an active comparator. The primary outcome was mean percentage change in TBS from baseline. Study selection, data extraction, and risk-of-bias assessment were performed independently by two reviewers. Randomised and non-randomised studies were analysed separately using random-effects inverse-variance models. Heterogeneity was assessed using the  $I^2$  statistic.

**Results:** Sixty studies published up to October 2025 were included (17 RCTs, 43 non-randomised). In placebo-controlled trials, bisphosphonates were associated with small, non-significant changes in TBS at 12m (mean difference [MD] 0.52%, 95% CI -0.58 to 1.63;  $I^2=0\%$ ), with similar findings at 24m. Denosumab significantly increased TBS at 12 months (MD 1.41%, 95% CI 0.29 to 2.54;  $I^2=0\%$ ) and up to 10y. Anabolic therapies showed larger effects: teriparatide significantly increased TBS at 24m (MD 2.53%, 95% CI 1.74 to 3.32;  $I^2=0\%$ ), while romosozumab produced a marked increase at 12m (MD 4.16%, 95% CI 3.68 to 4.64;  $I^2=60.5\%$ ). Romosozumab also resulted in greater TBS gains than alendronate and denosumab at 12m.

**Conclusions:** Anti-osteoporotic therapies demonstrate distinct, treatment-specific patterns of change in TBS. Antiresorptive agents primarily stabilise trabecular microarchitecture, whereas anabolic