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EVOLIUCINĖ MEDICINA: ŽMOGAUS RAIDOS PERSPEKTYVOS IR SVEIKATA BESIKEIČIANČIOJE APLINKOJE

EVOLUTIONARY MEDICINE: PERSPECTIVES ON HUMAN DEVELOPMENT AND HEALTH CONSEQUENCES IN A CHANGING ENVIRONMENT

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COMPARATIVE ANATOMY OF THE MAMMALIAN OPHTHALMIC ARTERY: A SYSTEMATIC REVIEW OF ANATOMICAL, MORPHOMETRIC, AND METHODOLOGICAL TRENDS

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Background and Aim: Comparative anatomy studies are crucial for understanding human anatomy and the evolution of different structures, however, there is a lack of knowledge about comparing analogous structures between animals and humans. The aim of this study was to systematically review the available literature on the anatomy of the mammalian ophthalmic artery (OA) and its morphometric data in different mammalian species.
Materials and Methods: A systematic literature review was conducted according to PRISMA recommendations using PubMed, ScienceDirect, Scopus, and WoS databases. In total, 3572 records were identified, 2201 records were screened. Full texts of 95 articles were assessed for eligibility.
Results: Human-only studies constituted 1546 out of 2201 (70.3%), non-human mammalian studies 551/2201 (25%), and mixed or other non-mammalian species studies 104/2201 (4.7%). Artiodactyla and Carnivora represented the largest proportion of non-human mammalian studies, whereas several additional mammalian orders were represented only by isolated, uneven reports. Comparative analysis appeared feasible for beginning of the artery, course, branching pattern, and relationship to the optic nerve. However, quantitative morphometric synthesis was limited by inconsistent reporting in non-human mammals. Proximal OA diameter was reported in 7/41 (17%) non-human mammalian studies versus 21/54 (38.9%) human studies; distal diameter in 1/41 (2.4%) versus 10/54 (18.5%); and OA length in 2/41 (4.9%) versus 18/54 (33.3%), respectively. Non-human mammalian studies more frequently described arterial anastomoses (29/41; 70.7%) and rete mirabile-associated vascular patterns (20/41; 48.8%). Human studies more frequently used cadaveric dissection (32/54; 59.3%), whereas non-human mammalian studies more commonly used injection/corrosion cast techniques (28/41; 68.3%). Scanning electron microscopy was identified exclusively in non-human mammalian studies (7/41; 17.1%).
Conclusions: The available literature is lacking in non-human OA studies, but supports qualitative comparative analysis of mammalian OA anatomy; however, a generalised cross-species morphometric synthesis remains limited due to inconsistent morphometric presentation, methodological heterogeneity, and inconsistent taxonomic representation.

Keywords: comparative anatomy, mammalian species, morphometry, ophthalmic artery, systematic review