Morphofunctional adaptations of the olfactory mucosa in postnatally developing rabbits.

Kavoi BM, Makanya AN, Plendl J, Kiama SG.

Source

Department of Veterinary Anatomy & Physiology, University of Nairobi, Nairobi, Kenya.
drkanvo@yahoo.com

Erratum in


Abstract

Rabbits are born blind and deaf and receive unusually limited maternal care. Consequently, their suckling young heavily rely on the olfactory cue for nipple attachment. However, the postnatal morphofunctional adaptations of olfactory mucosa (OM) are not fully elucidated. To clarify on the extent and the pattern of refinement of the OM following birth in the rabbit, morphologic and morphometric analysis of the mucosa were done at neonatal (0–1 days), suckling (2 weeks), weanling (4 weeks), and adult (6–8 months) stages of postnatal development. In all the age groups, the basic components of the OM were present. However, proliferative activity of cells of the mucosal epithelium decreased with increasing age as revealed by Ki-67 immunostaining. Diameters of axon bundles, packing densities of olfactory cells, and cilia numbers per olfactory cell knob increased progressively with age being 5.5, 2.1, and 2.6 times, respectively, in the adult as compared with the neonate. Volume fraction values for the bundles increased by 5.3% from birth to suckling age and by 7.4% from weaning to adulthood and the bundle cores were infiltrated with blood capillaries in all ages except in the adult where such vessels were lacking. The pattern of cilia projection from olfactory cell knobs also showed age-related variations, that is, arose as a tuft from the tips of the knobs in neonates and sucklings and in a radial pattern from the knob bases in weanlings and adults. These morphological changes may be attributed to the high olfactory functional demand associated with postnatal development in the rabbit.

Copyright © 2012 Wiley Periodicals, Inc.