IN THE NEWS

A close shave

Baby-faced men might be more susceptible to stroke than their hirsute peers, according to a study reported in the *American Journal of Epidemiology*. The study began 20 years ago, when a team at the University of Bristol questioned 2,438 men about their lifestyles. Subsequently, they found that the men who did not shave every day were 70% more likely to suffer a stroke.

The interpretation of the data was complicated by the fact that frequency of shaving might reflect a man's attitude to grooming as much as his hairiness. As *The Times* (UK, 6 February 2003) points out, "men who choose not to shave daily probably neglect themselves in other ways, contributing to ill-health." The team noted that "stubbled men were more likely to smoke, were shorter, less likely to be married and more likely to do manual jobs."

The Beard Liberation Front — a UK support group that campaigns against 'beardism' — resented the implication that not shaving signifies an unhealthy lifestyle. Spokesman Keith Flett said "just shaving in itself seems stressful and unhealthy to us. Bearded men don't have to get out of bed early in the morning to shave and are more laid back" (*Ananova*, UK, 6 February 2003).

Even when other lifestyle factors were accounted for, there was still an unexplained correlation between stroke and shaving frequency. Team leader Shah Ibrahim said "There may well be some male sex hormone link with stroke" (*The Independent*, UK, 5 February 2003); for example, smooth-faced men might produce less testosterone than men who grow whiskers more readily. As *The Independent* informs us, "the link between shaving and sex was established in 1970 by a man living on a remote island who noticed that each time he went to the mainland, where he had sex, his beard grew more quickly."

Heather Wood

SENSORY SYSTEMS

Pathway to pain

In the not-so-distant past, it was standard clinical practice for newborn babies to undergo painful medical procedures without anaesthesia. This policy was based on the assumption that neonate mammals do not feel pain, an assumption that we now know to be incorrect. Not only can newborns feel pain, they are actually hypersensitive to mechanical stimuli — a characteristic so far thought to be mediated through the activation of low-threshold mechanoreceptors (LTMRs) in the skin. But a new study by Woodbury and Koerber challenges the LTMR-based hypothesis by providing evidence that a subset of high-threshold mechanoreceptors (HTMRs) with new morphology are instead responsible for the exaggerated pain reflexes of neonates.

Hypersensitivity to pain affects mice during the first 3 weeks of life. It has long been believed that LTMRs located in the skin possess extensive projections to superficial dorsal horn laminae — pain-specific regions of the spinal cord — and are therefore responsible for the perception of noxious stimuli during the hypersensitive period. According to the 'delayed maturity' hypothesis this 'inappropriate' projection of LTMRs into pain-specific areas undergoes gradual correction, so that by the third week of life LTMR projections adopt the more centralized pattern that characterizes adult anatomy, and hypersensitivity therefore subsides.

However, in a study published in 2001, Woodbury and colleagues showed that the delayed maturity scenario does not apply to LTMRs. The authors used an *ex vivo* somatosensory preparation to show that the LTMRs of neonatal mice are essentially miniaturized versions of their adult counterparts that do not project into pain-specific regions, and are therefore incapable of mediating the hypersensitive response. So, if LTMRs are not doing the job, what is?

In the new study, published in *The Journal of Neuroscience*, Woodbury and Koerber turned their attention to HTMRs, an experimentally neglected population of pain receptors. Using the same *ex vivo* preparation with skin and spinal cord in continuity, the authors identified two subsets of HTMRs, one of which gives rise to widespread projections throughout the entire dorsal horn laminae. So, this HTMR subset is ideally situated for the transduction of pain signals. In addition, electrophysiological data showed that the response of this HTMR population becomes increasingly vigorous as the intensity of painful stimuli increases — a physiological profile that makes these HTMRs ideally configured for warning against potential damage from noxious insults.

Interestingly, the postnatal development of HTMRs provides further justification for abandoning the delayed maturity hypothesis of mechanoreceptor development. As is the case for LTMRs, the neonatal phenotype of HTMRs matches that of their adult counterparts. If there are no notable alterations of the anatomy or physiology of the HTMR population, how is the hypersensitive response downregulated by the third week of life? The authors suggest that functional maturation of inhibitory inputs may confer the postnatal decrease in hypersensitivity, an idea that warrants further investigation as we rethink the mechanisms that regulate this intriguing developmental pathway.

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References and links

ORIGINAL RESEARCH PAPER Woodbury, C. J. & Koerber, H. R. Widespread projections from myelinated nociceptors throughout the substantia gelatinosa provide novel insights into neonatal hypersensitivity. *J. Neurosci.* **23**, 601–610 (2003)

FURTHER READING Woodbury, C. J. *et al*. Central anatomy of individual rapidly adapting low-threshold mechanoreceptors innervating the 'hairy' skin of newborn mice: early maturation of hair follicle afferents. *J. Comp. Neurol.* **436**, 304–323 (2001)

WEB SITES

Encyclopedia of Life Sciences: http://www.els.net/somatosensory system

Richard Koerber's laboratory: http://www.neurobio.pitt.edu/faculty/koerber.htm