

Olfaction – the Cinderella of the senses?

In the United Kingdom this time of year is traditionally the occasion for a very particular entertainment, the Christmas pantomime. One of the most popular subjects for this comedy pastiche of fairy tale and morality play is the story of Cinderella, that archetypal tale of ‘rags to riches’. Whilst the analogy may seem a little far-fetched, olfaction is not infrequently referred to as the ‘Cinderella of the senses’ presumably as it is perceived as receiving less attention than the other senses so it is perhaps appropriate that this December issue should contain a number of publications on this topic.

Smell influences our lives from conception to death, our very survival may depend on it and yet it is interesting to reflect that whilst Nobel prizes were given in the early 1960’s for the discovery of the rod and cone mechanism in the eye and to von Bekesy for his work on hearing, it was not until 2004 that Richard Axel and Linda Buck received the Nobel Prize in Physiology or Medicine for discovering olfactory receptor proteins which make up the largest gene family thus discovered. The exact mechanism by which odours are perceived by the brain remains largely enigmatic as does the role of the accessory olfactory vomeronasal organ, an area explored by Braun et al in this issue ⁽¹⁾, despite it being first described by Jacobson in 1811 ⁽²⁾.

The negative impact of loss of smell on quality of life has been shown by a number of authors ⁽³⁻⁶⁾. It has also been shown to be a major concern in survivors of sinonasal malignancy who have had the olfactory system removed by craniofacial resection ⁽⁷⁾ or damaged by chemoradiation ^(8,9) and as a consequence is a recommended area of research in the recent European Position Paper on the endoscopic management of tumours in this region ⁽¹⁰⁾.

The early adverse effect of neurodegenerative diseases on olfaction has stimulated a lot of interest as its detection may enable population screening and therapeutic intervention. As long ago as 1998 a meta-analysis of 43 papers comparing Alzheimer’s and Parkinson’s disease with controls showed significant defects in odour identification, recognition and detection threshold in these conditions ⁽¹¹⁾. This is becoming of greater importance as the population ages world-wide ⁽¹²⁾.

Temporary loss of smell is of course rather common. In a study of 2197 women aged between 50-64 years, 15% experienced one or more episodes of temporary anosmia usually associated with nasal obstruction during a prospective diary study over one year ⁽¹³⁾. However, common causes of more chronic loss include viral upper respiratory infection, head trauma and chronic sinonasal conditions such as nasal polyposis ⁽¹⁴⁻¹⁶⁾ though as is so often the case, ‘idiopathic’ remains one of the

largest groups in such studies. The lower respiratory tract can also provide a further confounding factor in the adverse effect of nasal polyposis on smell ⁽¹⁷⁾.

The effects of many of these causes of olfactory loss on the olfactory bulbs have been elegantly demonstrated on MRI by Rombaux and colleagues ⁽¹⁸⁾. However, from a clinical point of view, whilst access to a range of olfactory tests is improving, these are not universally available and often need linguistic and cultural validation ^(19,20).

Although a considerable amount of research has undertaken into olfaction, many clinicians still seem rather nihilistic about loss of smell, perhaps because they feel that little can be done to positively influence it. However, a number of recent studies ⁽²¹⁻²⁴⁾ have shown improvement in olfaction following sino-nasal surgery for chronic rhinosinusitis with or without nasal polyposis, albeit in the short-term. Rowe-Jones et al., in their seminal long-term study after endoscopic sinus surgery were able to show sustained benefit in olfactory detection threshold at one and two years post-operatively although there was no statistical difference at the end of 5 years of follow-up ⁽²⁵⁾.

A range of medical therapies are also available which alone or in combination with surgery, may improve and /or maintain olfactory improvement ^(4-6,21,24). Foremost of these are steroids, in particular when given systemically in nasal polyposis, as demonstrated by Kirtsreesakul et al., in one of a small number of placebo-controlled studies in this area though there is still debate as to the dose, duration and frequency with which this course of treatment may be used ⁽²⁶⁻²⁸⁾. There is also interest in more unusual preparations and approaches which may hold promise for the future ^(29,30).

Thus one may conclude that whilst it may have been true in the past that olfaction was a rather neglected area of basic and clinical research, as for Cinderella, there is a happy ending or at least an enormous burgeoning of interest in all aspects of this fascinating sense.

So as the end of the year approaches, on behalf of myself, Professor Fokkens and all the editorial and administrative staff at ‘Rhinology’ I would like to wish you the very best compliments of the season with excellent smell and taste to enjoy it.

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