

enhanced in the humid and warm Malaysian weather. Axillary  $3\alpha$ -androsthenol levels in women is postulated to play a role as a synchronising pheromone<sup>12</sup> and it is found to show menstrual variation; the highest concentration of this compound being produced in the mid-follicular phase, prior to ovulation.<sup>8</sup> Recently research has shown that axillary compounds from women in this phase of the menstrual cycle shorten both the time to ovulation and the length of the menstrual cycle, whereas in the ovulatory phase they lengthen both these parameters.<sup>13</sup> Therefore  $3\alpha$ -androsthenol is a possible pheromone included in axillary compounds secreted in the follicular phase. Morofushi *et al.* demonstrated that all the synchronised women in their study could detect  $3\alpha$ -androsthenol,<sup>6</sup> however in the present study the ability to smell the putative pheromone,  $3\alpha$ -androsthenol, was found to be similar in synchronised and non-synchronised subjects.

Other glands believed to secrete pheromones are located in the vagina. Genital scents are said to be the most potent in attracting the opposite sex.<sup>13</sup> The present study shows that the hygiene score was lower among synchronised subjects, suggesting that other chemicals present in the vaginal discharge or menstrual blood flow during menstruation may play a role in synchrony.

We studied the effect on menstrual synchrony of other smells such as cigarette smoke, soap scent and male or female perfume, none of which were found to be significantly different between the two groups of synchronised and non-synchronised partners.

## Conclusions

Menstrual synchrony was found in 59% of our study population. However, the ability to smell  $3\alpha$ -androsthenol was found to be similar between the two groups of synchronised and non-synchronised subjects. Other chemical compounds present in menstrual blood or vaginal discharge might be responsible for the synchronisation since the personal hygiene score was found to be lower in synchronised subjects.

## Statements on funding and competing interests

**Funding** This study was funded by the Royal College of Medicine, Perak, University of Kuala Lumpur.

**Competing interests** None identified.

## References

- McClintock MK. Menstrual synchrony and suppression. *Nature* 1971; **229**: 244–245.
- Treloar AE, Boynton RE, Behn BG, Brown BW. Variation of human menstrual cycle through reproductive life. *Int J Fertil* 1967; **12**: 77–126.
- Weller A, Weller L. Menstrual synchrony under optimal conditions: Bedouin families. *J Comp Psychol* 1997; **111**: 143–151.
- McClintock MK. Pheromonal regulation of the ovarian cycle: enhancement, suppression, and synchrony. In: Vandenberg JG (ed.), *Pheromones and Reproduction in Mammals*. New York, NY: Academic Press, 1983; 113–149.
- Schank JC, McClintock MK. A coupled-oscillator model of ovarian-cycle synchrony among female rats. *J Theor Biol* 1992; **13**: 737–738.
- Morofushi M, Shinohara K, Funabashi T, Kimura F. Positive relationship between menstrual synchrony and ability to smell 5-androst-16-en-3-ol. *Chem Senses* 2000; **25**: 407–411.
- Pause BM. Is the human skin a pheromone producing organ? *J Cosmet Dermatol* 2004; **3**: 223.
- Preti G, Cutler WB, Christensen CM, Lawley HJ, Huggins GR, Garcia CR. Human axillary extracts: analysis of compounds from samples which influence menstrual timing. *J Chem Ecol* 1987; **13**: 717–731.
- Perry GC, Patterson RLS, MacFie HJH, Stinson CG. Pig courtship behavior: pheromonal property of androstene steroids in male submaxillary secretion. *Anim Prod* 1980; **31**: 191–199.
- Hummel T, Krone F, Lundstrom JN, Bartsch O. Androstadienone odor threshold in adolescents. *Horm Behav* 2005; **47**: 306–310.
- Trevathan WR, Burleson MH, Gregory WL. No evidence for menstrual synchrony in lesbian couples. *Psychoneuroendocrinology* 1993; **18**: 425–435.
- Leyden JJ, McGinley K, Holze E, Labows JN, Kligman AM. The microbiology of the human axilla and its relationship to axillary odour. *J Invest Dermatol* 1981; **77**: 413–416.
- Stern K, McClintock MK. Regulation of ovulation by human pheromones. *Nature* 1998; **392**: 177–178.

## BOOK REVIEWS

**Menopause: Answers at Your Fingertips.** H Currie. London, UK: Class Publishing, 2006. ISBN: 1-85959-155-8. Price: £17.99 (currently available from the publisher's website at the special offer price of £12.99). Pages: 220 (paperback)

When I began working for the Journal in 2004, my very first article covered the flurry of media panic over hormone replacement therapy (HRT) following the Million Women Study. I explored the unfortunate impact on women nationwide, and reported on several pieces of *ad hoc* research suggesting that women had become wary of medical solutions.

So when I read the back cover blurb of *Menopause: Answers at Your Fingertips* – and saw that its main aim was to meet such wariness head on, and ‘debunk the scare stories’ about medical solutions – I gave a silent cheer. At last a solid, experience-based book that could help pre- and postmenopausal women make sense of all that they’ve heard about HRT.

The book undoubtedly keeps faith. It explains the climacteric and its symptoms, and goes into depth about osteoporosis, contraception, diet, exercise, lifestyle and other assorted medical problems. And, as promised, it gives thorough and balanced coverage of the HRT issue, and avoids the ‘shut up and take the tablets’ approach by covering in just as much detail the non-HRT drug therapies and the non-

medical alternatives to HRT. The style is clear, accessible, non-patronising, and the resources section full and well researched. I’d happily recommend the book to patients as background reading and support for menopausal symptoms.

But – and it’s a fairly big but – I would also recommend that patients (and their partners) don’t just stop there, and that they top up this excellent primer with additional reading. Because what the authors have missed out on – in their flurry to cover medical topics – is anything but surface coverage of the emotional issues surrounding the menopause. Even the chapter headed ‘Sex, relationships and work’ deals largely with how these are affected by physical problems.

I’m not moving into active criticism here; I suspect the authors’ brief for this book was to major on the facts and steer clear of the ‘fluffy’. All I ask is that if you do offer this book to one of your patients, you remember that menopause isn’t just a hormonal event. It’s a life changing and deeply challenging process – and so ‘fluffy’ coverage of the emotional backlash may also be needed. In which case, either recommend another of the more counselling-based books on the market – or ask the vital question ‘How are you feeling?’, and meet your patients’ emotional needs yourself.

Reviewed by **Susan Quilliam**, BA, Cert Ed, MNLP  
Freelance Writer, Broadcaster and Agony Aunt,  
Cambridge, UK

**The Menopause: What You Need to Know.** M Rees, DW Purdie, S Hope (eds). London, UK: Royal Society of Medicine Press, 2006. ISBN: 1-85315-672-8. Price: £10.95. Pages: 104 (paperback)

The second edition of this handbook, published on behalf of the British Menopause Society, provides a valuable source of up-to-date information about health problems associated with the menopause for health professionals and also to women experiencing the menopause.

The text is designed to help women understand the changes they may experience during the menopause and the treatment options available to them.

The book provides unbiased information for health professionals on subjects such as contraception and sexual health in older women, osteoporosis, myocardial infarction, ischaemic stroke, dementia and urinary incontinence. The benefits, risks and controversies regarding hormone replacement therapy and also the alternative therapies are critically reviewed. Each chapter has a list of relevant references.

Reviewed by **R K Bhatena**, FRCOG, FFFP  
Consultant Obstetrician and Gynaecologist,  
Bombay, India