JOURNAL CLUB

Oestrogen induces mucoid conversion of *Pseudomonas Aeruginosa* in women with cystic fibrosis, and increases exacerbations

This study assesses whether oestradiol contributes to early mucoid *pseudomonas* colonisation and increased exacerbation frequency in female patients with cystic fibrosis (CF).

In vitro oestradiol induced more alginate production, defining mucoid conversion, at 3 days and 4 weeks compared with ethanol and testosterone, and more mucoid colonies were seen at 4 weeks following oestradiol culture. In 80% of oestradiol-exposed colonies, a frameshift mutation in the *mucA* gene was identified causing loss of gene function and development of *pseudomonas* mucoidy.

Exacerbations closely followed oestradiol levels with increased numbers seen during the high oestradiol follicular phase. However, the sample size was small, 44 patients and 139 exacerbations, with only 23 patients and 72 exacerbations analysed. The percentage of mucoid sputum isolates was also higher during the follicular phase, compared with the luteal phase when no mucoid strains were isolated, although again the sample size was small. Oestradiol was higher during exacerbations in women than in the stable disease state, validating the relationship between oestradiol and exacerbation frequency. This trend was not seen in men and women taking the oral contraceptive pill.

Estradiol induces mucoid conversion of *Pseudomonas aeruginosa* in women with CF, through mutation of *mucA*, and is associated with increased exacerbations. The oral contraceptive pill appears to attenuate this effect, and may prove to be an effective therapeutic intervention in postpubertal females colonised with pseudomonas, although further trials are needed.

► Chotirmall SH, Smith SG, Gunaratnam C, et al. Effect of estrogen on pseudomonas mucoidy and exacerbations in cystic fibrosis. *N Engl J Med* 2012;366:1978–86.

Gemma Hayes

Correspondence to Dr Gemma Hayes, Department of Respiratory Medicine, Derriford Hospital, Derriford Road, ST4, Crownhill, Plymouth PL6 8DH, UK; gemmahayes1@nhs.net

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