EDITORIAL

Two important novelties in etiopathogenesis and therapy of acne

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The reclassification from *Propionibacterium acnes* to *Cutibacterium acnes* was proposed in 2016.[1] A standardized method to perform molecular typing of *C. acnes*, according to the degree of resolution needed (phylotypes, clonal complexes, single-locus sequence typing), has been recently suggested.[2]

In the first article of this supplement, the authors review the most recent data on *C. acnes* and its involvement in etiopathogenesis of acne.[3] New findings on *C. acnes* have revealed that, contrary to what was previously thought, its proliferation is not the trigger of acne. A tight equilibrium between members of the skin flora and *C. acnes* phylotypes might play a more critical role in acne onset. Loss of microbial diversity can indeed lead to chronic inflammatory skin diseases. In particular, the presence of *C. acnes* phylotypes in patients with acne and healthy subjects is discussed: some *C. acnes* strains and unique genomic sequences seem to be associated with acne development and severity. In the same article, a review of the state of the art on virulence factors, the role and importance of biofilms in resistance of *C. acnes* to antibiotics and the relationships between phylotypes and antibacterial susceptibility are presented.[3]

The second article is on Myrtacine® activity in acne.[4] Myrtle (*Myrtus communis* Linnaeus 1753) belongs to the family *Myrtaceae*. More than 40 different varieties of myrtle are known. It grows in arid grounds, mainly in Sardinia, but also in Spain, Corsica, Greece, Tunisia and Algeria. The liqueur ('mirto') obtained from its fruits is famous. Myrtacine® is an ethanolic extract of myrtle leaves.[5] It contains 6% A and B myrtucommulones (or acylphloroglucinol), with antibacterial activity, and 15%–20% ursolic acid, with anti-inflammatory activity.[5] An antiproliferative action has also been demonstrated: Myrtacine® inhibits keratinocyte proliferation by 27% and 76% at 1 and 3 μg/mL, respectively.[5] At concentrations ranging from 0.0001% to 0.03%, Myrtacine® inhibits the proliferation of planktonic and non-planktonic *P. acnes* strains which are sensitive or resistant to erythromycin.[5–7] This inhibition occurs at much lower concentrations than with benzoyl peroxide. On *P. acnes* biofilm, 0.1% Myrtacine® has two complementary actions: (i) very rapid inhibitory action on biofilm formation, after 5 h of contact, and (ii) destruction of biofilm, after 1 min of contact.[6] Furthermore, Myrtacine® decreases the synthesis of proinflammatory mediators via the cyclooxygenase and lipooxygenase pathways, and the lipase activity.[5] This anti-inflammatory action of Myrtacine® was demonstrated by a sponsor-free, multicentre, prospective, randomized, parallel-group study in 164 patients with mild to moderate acne, who previously developed a retinoid dermatitis.[8] One group of patients was treated with 0.2% Myrtacine® and 4% nicotinamide (2 applications/day); the second group was treated with a moisturizer (2 applications/day). Patients treated with the Myrtacine®/nicotinamide combination showed a statistically significant improvement in symptoms (pruritus, stinging and burning sensation) as well as signs (erythema, dryness and oedema).[8] Good clinical results were observed also in patients with nodular acne.[9]

The Myrtacine® study published in this supplement to *JEADV* demonstrates that (i) *C. acnes* colonization is high, but not significantly different, in both patients with mild to moderate acne and healthy control subjects, and (ii) phylotype IA is predominant in acne patients. In addition, the authors observed that a cream containing Myrtacine® induced a decrease in acne severity according to the Global Acne Severity Scale (GEA), a decrease in non-inflammatory and inflammatory lesions, reduced porphyrin synthesis by *C. acnes* and a significantly reduced load of erythromycin-resistant strains of *C. acnes*.[4]

References

1 Scholz CF, Kilian M. The natural history of cutaneous propionibacteria, and reclassification of selected species within the genus *Propionibacterium* to the proposed novel genera *Acidipropionibacterium* gen. nov., *Cutibacterium* gen. nov. and *Pseudopropionibacterium* gen. nov. *Int J Syst Evol Microbiol* 2016; **66**: 4422–4432.

2 Dagnelie MA, Khammari A, Dréno B, Corvec S. *Cutibacterium acnes* molecular typing: time to standardize the method. *Clin Microbiol Infect* 2018; https://doi.org/10.1016/j.cmi.2018.03.010 [Epub ahead of print].

3 Dréno B, Pécastaings S, Corvec S, Veraldi S, Khammari A, Roques C. *Cutibacterium acnes* (*Propionibacterium acnes*) and acne vulgaris: a brief look at the latest updates. *J Eur Acad Dermatol Venereol* 2018; **32**(Suppl. 2): 4–13.

4 Pécastaings S, Roques C, Khammari A *et al.* Characterisation of *Cutibacterium acnes* phylotypes in acne patients and explanatory evaluation of Myrtacine®. *J Eur Acad Dermatol Venereol* 2018; **32**(Suppl. 2): 14–22.

5 Fiorini-Puybaret C, Aries MF, Fabre B *et al.* Pharmacological properties of Myrtacine® and its potential value in acne treatment. *Planta Med* 2011; **77**: 1582–1589.

6 Feuillolay C, Pecastaings S, Le Gac C *et al.* A *Myrtus communis* extract enriched in myrtucummulones and ursolic acid reduces resistance of *Propionibacterium acnes* biofilms to antibiotics used in acne vulgaris. *Phytomedicine* 2016; **23**: 307–315.
7 Pannu J, McCarthy A, Martin A *et al. In vitro* antibacterial activity of NB-003 against *Propionibacterium acnes*. *Antimicrob Agents Chemother* 2011; **55**: 4211–4217.
8 Veraldi S, Giovene GL, Guerriero C, Bettoli V. Efficacy and tolerability of topical 0.2% Myrtacine® and 4% vitamin PP for prevention and treatment of retinoid dermatitis in patients with mild to moderate acne. *G Ital Dermatol Venereol* 2014; **147**: 491–497.
9 Naik M, Chavda R, Durosier V, Mukaddam Q, Kharkar R. Keracnyl® in the management of acne. *Indian J Clin Practice* 2012; **23**: 1–5.