

## INTI SARI

**Latar Belakang:** Vitamin D merupakan *pro-hormone* yang disintesis secara endogen di kulit saat terpapar sinar matahari. Manfaat vitamin D di kulit dihubungkan dengan adanya *vitamin D receptor* (VDR) yang terdapat di keratinosit dari lapisan basal dan spinosum epitel kulit. Interaksi antara vitamin D dan VDR berperan dalam pengaturan proliferasi keratinosit sel basal yang berfungsi sebagai penghalang fisik dan pada lapisan spinosum, vitamin D juga berperan dalam meningkatkan regulasi diferensiasi sel yang memediasi sintesis keratin, involukrin, transglutaminase, lorikrin dan filaggrin. Selain itu vitamin D juga berperan dalam modulasi respon imun dan menginduksi ekspresi gen yang mengkode *antimicrobial peptides* (AMP) katelisin dan  $\beta$ -defensin, yang berfungsi membunuh patogen dan mengatur keseimbangan flora di kulit. Hingga saat ini, penelitian spesifik tentang pengaruh vitamin D terhadap flora normal kulit, baik dilihat dari kuantitas maupun jenis flora, belum pernah dilakukan.

**Tujuan:** Penelitian ini bertujuan untuk mengetahui efek vitamin D topikal terhadap jumlah dan jenis flora normal pada kulit dibandingkan dengan losion pembanding.

**Material dan Metoda:** Desain penelitian ini adalah uji klinik acak tersamar ganda berpembanding bahan pembawa (*double blind randomized vehicle controlled trial*). Subjek penelitian laki-laki sehat berusia 20-40 tahun. Randomisasi yang digunakan adalah *split body randomized*. Kelompok perlakuan akan mendapatkan losion dengan vitamin D dan kelompok kontrol akan mendapatkan losion yang berisi bahan pelembab kulit, yang selanjutnya disebut dengan losion pembanding. Peneliti dan subjek penelitian tidak mengetahui jenis obat yang diberikan hingga akhir penelitian. Identifikasi bakteri dengan kultur dan kuantifikasi bakteri dengan metode *total plate count* dilakukan dua kali, yaitu sebelum dan 2 minggu setelah menggunakan losion. Karakteristik subjek dan jenis flora normal kulit disajikan secara deskriptif. Analisis statistik dilakukan untuk mengetahui perbandingan kuantitas bakteri sebelum dan sesudah pemberian losion.

**Hasil:** Dari 16 subjek yang diteliti pemberian vitamin D menyebabkan pergeseran flora seperti *Bacillus sp.* sebanyak 40%, *Staphylococcus coagulase negatif* 36,67%, *Micrococcus sp.* 10%, *Staphylococcus aureus* 10% dan *Coryneform* 3,33%. Rerata jumlah koloni bakteri sebelum pemberian losion pembanding 1341,25 CFU/g dan sesudah pemberian losion pembanding 1901,25 CFU/g (nilai  $p = 0,650$ ). Rerata jumlah koloni bakteri sebelum pemberian losion vitamin D adalah 986,875 CFU/g dan sesudah 1891,875 CFU/g (nilai  $p = 0,925$ ). Rerata jumlah koloni bakteri pada kelompok kontrol dan perlakuan adalah 560 CFU/g dan 905 CFU/g (nilai  $p = 0,749$ ).

**Kesimpulan:** Terdapat perbedaan jenis bakteri di kulit sebelum dan sesudah pemberian losion, baik pada kelompok losion vitamin D maupun losion pembanding. Akan tetapi, tidak terdapat perbedaan jumlah koloni bakteri di kulit antara kelompok losion pembanding dan losion vitamin D.

**Kata Kunci:** vitamin D topikal, flora normal kulit, *antimicrobial peptide*

## ABSTRACT

**Background:** Vitamin D is a pro-hormone that is synthesized endogenously in the skin when exposed to sunlight. The benefits of vitamin D in the skin are related to the presence of vitamin D receptors (VDR) which are present in keratinocytes from the basal layer and spinosum of the epithelium of the skin. The interaction between vitamin D and VDR plays a role in regulating the proliferation of basal cell keratinocytes, which function as a physical barrier and in the spinous layer vitamin D also plays a role in increasing regulation of cell differentiation which mediates the synthesis of keratin, involucrin, transglutaminase, loricrine and filaggrin. In addition, vitamin D also plays a role in modulating immune responses and inducing the expression of genes encoding antimicrobial peptides (AMP) catelisinidin and  $\beta$ -defensin, which kill pathogens and regulate the balance of flora in the skin. Until now, specific research on the effect of vitamin D on normal skin flora, both in terms of quantity and type of flora, has never been carried out.

**Purpose:** This study aimed to determine the effect of topical vitamin D on the amount and type of normal flora on the skin compared to a comparison lotion.

**Material and Methods:** The design of this study was a double blind randomized vehicle controlled trial. The research subjects were healthy men aged 20-40 years. The randomization used was split body randomized. The treatment group will receive a lotion with vitamin D and the control group will receive a lotion containing skin moisturizing ingredients, here in after referred to as a comparison lotion. Researchers and research subjects did not know the type of drug given until the end of the study. Identification of bacteria by culture and quantification of bacteria using the total plate count method were carried out twice, namely before and 2 weeks after using the lotion. Subject characteristics and types of normal skin flora were presented descriptively. Statistical analysis was performed to determine the comparison of the quantity of bacteria before and after giving the lotion.

**Results:** Of the 16 subjects studied, vitamin D caused shifting of flora such as *Bacillus sp.* 40%, *Staphylococcus coagulase negative* 36.67%, *Micrococcus sp.* 10%, *Staphylococcus aureus* 10% and *Coryneform* 3.33%. The mean number of bacterial colonies before giving the comparison lotion was 1341.25 CFU / g and after giving the comparison lotion 1901.25 CFU / g (p value = 0.650). The mean number of bacterial colonies before giving vitamin D lotion was 986.875 CFU / g and after 1891.875 CFU / g (p value = 0.925). The mean number of bacterial colonies in the control and treatment groups was 560 CFU / g and 905 CFU / g (p value = 0.749).

**Conclusion:** There were differences in the types of bacteria on the skin before and after giving lotion, both in the vitamin D lotion group and the comparison lotion. However, there was no difference in the number of bacterial colonies on the skin between the comparison lotion and vitamin D lotion groups.

**Keywords:** topical vitamin D, normal skin flora, antimicrobial peptide