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A SPECIAL FOAM FOR CLEANSING THE SKIN

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Summary

The skin with its area between 1.5 and 2.3 mq. is the largest organ of the human body.
With the exception of the nails, no skin area appears to be without a resident microbial flora and all areas have a transient or contaminant bacteria and fungi whose staphylococcus and micrococci represent the major groups.
What it is to remember is that gram-negative bacilli and fungi are particularly affected by high temperature and expecially by humidity.
For the above reasons we deemed it interesting to control the antimicrobial and antifungal efficiency of a new cleansing foam in different condition of temperature and humidity, in order to evaluate its effectiveness at different latitudes, given the present mobility of world population.
In this study it was used a handwash viable-count sampling technique, the hands being rinsen via standard way with our foam.
The studied foam caused a progressive reduction of 99% of bacteria and fungi after six successive treatments in any condition of humidity.
The same reduction was also obtained after a single application.
No side effects were observed.
This foam thanks to its antibacterial activity and user-friendliness can be considered a new cosmeceutical for the daily usage of frequent travellers and for daily hand washing of doctors and medical personnel at surgeries and hospital departments.

Riassunto

La cute, con un'estensione compresa tra 1,5 e 2,3 mq , è l'organo più grande del corpo umano. Con l'eccezione delle unghie, nessuna zona cutanea è priva di flora batterica e tutte le aree sono colonizzate con batteri e funghi di cui gli stafilococchi e i micrococchi rappresentano la parte predominante.
Ciò che è interessante ricordare è che i batteri gram-negativi ed i funghi sono sensibili alle alte temperature, ed in particolare all'umidità, variando quindi con le condizioni climatiche.

Per tutti questi motivi, è stata controllata l'efficacia antimicrobica ed antifungina di una nuova schiuma detergente utilizzata sia come bagno-doccia giornaliera, che come detergente, soprattutto delle mani, per valutarne la sua attività a diverse latitudini.
La spuma utilizzata si è rivelata molto attiva sia nell'uso continuativo, quale bagno-doccia del corpo, che come detergente delle mani.
La riduzione batterica elevata anche dopo un'unica applicazione, raggiungeva il 99% di efficacia dopo ripetute applicazioni senza provocare effetti collaterali negativi.
Interessante è stata anche l'alta attività rivelata nei confronti del pityrosporon ovale, presente spesso nella dermatite seborroica, nella pitiriasi versicolor ed in alcune forme di dermatite atopica.
Per tutti questi motivi, questa spuma rappresenta un utile mezzo per la detersione globale delle persone ospedalizzate prima di effettuare interventi chirurgici e per la detersione delle mani di persone che debbano detergerle continuamente per motivi di lavoro, quali i chirurghi plastici, gli odontoiatri o le infermiere addette, ad esempio, ai reparti di puericultura.

INTRODUCTION

The skin with its area between 1.5 and 2.3 mq. is the largest organ of the human body.
With the exception of the nails, no skin area appears to be without a resident microbial flora and all areas have a transient or contaminant bacteria and fungi whose staphylococci and micrococci represent major groups.
The main bacterial species commonly found on healthy human skin are the propionibacteria, coaugulase-negative staphylococci, and aerobic coryneform (1) Generally staphylococci and aerobic coryneforms are dominant on moist skin.
Moreover the dominant bacterium nearly contaminating infection following operations, for example, of the tip seems to be staphylococcus aureus (2,3) and as it is well known when the integrity of the skin barrier is interrupted by disease or trauma, a variety of nonresident bacteria and fungi can flourish. For this reason bacterial flora on the patient's own skin is an important source of postoperative wounld infections. (4,5)
Naturally bacteria and fungi life has always related to skin surface lipids, microbial antagonisms, bacterial adherence, desquamation, pH, toxic products or secretory antibody and, last but not least, environment humidity and temperature. In fact microrganisms survive much longer on wet skin, and hydration not only elevates the microbial density, but also alters the relative ratios. (6,7)

AIM

The aim of this study was to control the antimicrobial and antifungal effinciency of a new cleansing foam in such way to reduce the skin flora in different condition of temperature and humidity, in order to evaluate its effectiveness at different latitudes, given the present mobility of world population.

MATERIALS AND METHODS

Material

MICOSPUMA A (active A): aqua, (water) decylglucoside, glycerin, PPG-buthet-26, PEG-40-hydrogenated castor oil, chlorhexedine digluconate, sodium hydroxymethylglycinate, methyl gluceth-20, lactic acid, triclosan, piroctone olamine, bisabolol, linseed acid, disodium EDTA, parfum, (fragrance).

MICOSPUMA B (control B): aqua, (water) decylglucoside, glycerin, PPG-buthet-26, PEG-40-hydrogenated castor oil, sodium hydroxymethylglycinate, methyl gluceth-20, lactic acid, bisabolol, linseed acid, disodium EDTA, parfum, (fragrance).

Methodology

Ist Study: 40 healthy volunteers (25 women and 15 men) aged between 18 and 27 years and divided in two sub-group (1 or 2) were involved in the study in a randomized way. All the volunteers were told to wash their entire body, including the scalp, with the MICOSPUMA A (active A) or (control B). The washing one day procedure entailed two consecutive throughout applications of the cleansing foam and rinsing under a hot shower, according to Brandberg and Andersson (7).
Before and after the shower bath, the bacterial skin samples were taken in 5 different skin areas of the body surface (forehead, cheeck, armpit, sternum and mid-thigh) according to Williamson and Kligman scrub method (8).
According to this tecnique a metal ring is held firmly against the skin surface and 1 ml. of wash fluid (0.075 M sodium phosphate buffer, pH 7.9, containing 0.1% v/v Triton-X 100) is pipetted into it. The skin surface within the ring is rubbed for 1 min. with a teflon policeman, which is lifted away from the skin every few

seconds and then replaced. Aliquots of the wash fluid are then plated onto the selected media, incubated in plastic bags at 37° C and read after 6 days.

No samples were taken before the skin was dry. The same study was performed controlling the effect of six consecutive daily bath. The degree of bacterial contamination was judged from the colony-forming unit (cfu) recorded on agar plates (25 cm2) after a 48 h. aerobic incubation at 37°C. To isolate P.ovale it is necessary to enrich the medium with lipid supplement such as glycerol, glycerol monostearate, tween 60 and cow's milk after an aerobic incubation at 37°C for at least 3-4 days, according to Leeming and Nothan (9)

The obtained results are reported in Tab 1-2 and Figure 1.

Table I

Amount of cfu/Plate recorded on 4 different skin areas before and after a one-day shower-bath with a cosmeceutical cleansing foam.

	APPROXIMATE NUMBER OF cfu/Plate		
SKIN AREA	BEFORE WASHING	AFTER WASHING MICOSPUMA -CONTROL B n=20	AFTER WASHING MICOSPUMA -ACTIVE A- n=20
FOREHEAD	≈ 50	≈ 8,000	≈ 0
CHECK	≈ 11,000	≈ 120,000	≈ 350
STERNUM	≈ 60	≈ 1,000	≈ 0
ARMPIT	≈ 500,000	≈ 20,000	≈ 60
MID-THIGH	≈ 30	≈ 150	≈ 0

Table 2

Amount of cfu/Plate recorded on 4 different skin areas before and after six consecutive daily bath with a cosmeceutical cleansing foam.

	APPROXIMATE NUMBER OF cfu/Plate		
ASKIN AREA	BEFORE WASHING	AFTER WASHING MICOSPUMA -CONTROL B n=20	AFTER WASHING MICOSPUMA -ACTIVE A- n=20
FOREHEAD	≈ 50	≈ 5,000	≈ 0
CHECK	≈ 11,000	≈ 90,000	≈ 10
STERNUM	≈ 60	≈800	≈ 0
ARMPIT	≈ 500,000	≈ 15,000	≈ 20
MID-THIGH	≈ 30	≈ 150	≈ 0

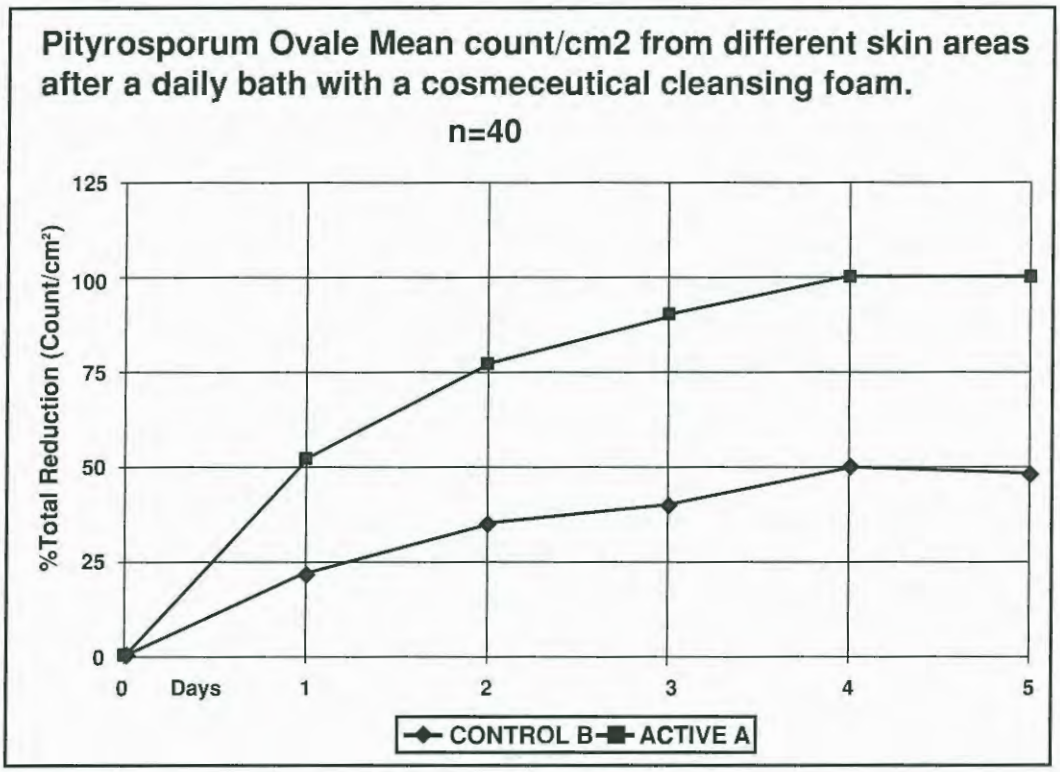

Fig. 1

2nd Study: This study was performed to control the efficacy of the ACTIVE A or CONTROL B micospuma on contaminated hands and forearms at normal condition and under occlusion. How it is known the occlusion of the skin, increasing the local humidity, elevates the microbial density. This generally happens to people leaving in countries with an high level of environment humidity.

The arms of 20 volunteers (10 men and 10 women) aged between 18 and 25 years were wrapped with a plastic film for 5 days and the bacterial samples were controlled each day according to Aly and Maibach (5). Before applying the wrapper the hand and the arms of the volunteers, previously, colonized with S aurens, so as to have at least 180 colony-forming units (cfu) were washed twice by an expert technician with the cleansing foam MICOSPUMA A or B respectively on the right or left arm and hand in a randomized way in 5-min periods. Each application was followed by rinsing under water, drying and bacterial sampling with contact plates according to Seeberg et al, (10).

Contact plates are specialized Petri dishes which are filled with any desired culture until the agar surface is slightly concave. They are pressed firmly onto the skin to remove surface bacteria.

The obtained results are reported in Figure 2-4.

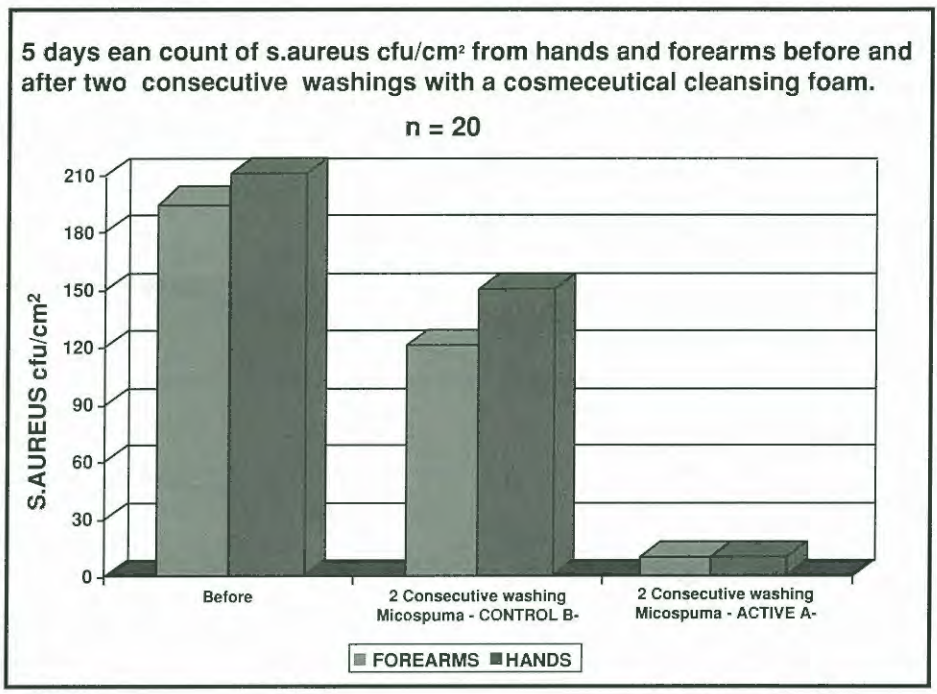
5 days ean count of s.aureus cfu/cm² from hands and forearms before and after two consecutive washings with a cosmeceutical cleansing foam.
n = 20
S.AUREUS cfu/cm²
210
180
150
120
90
60
30
0
Before
2 Consecutive washing Micospuma - CONTROL B-
2 Consecutive washing Micospuma - ACTIVE A-
FOREARMS
HANDS

Fig. 2

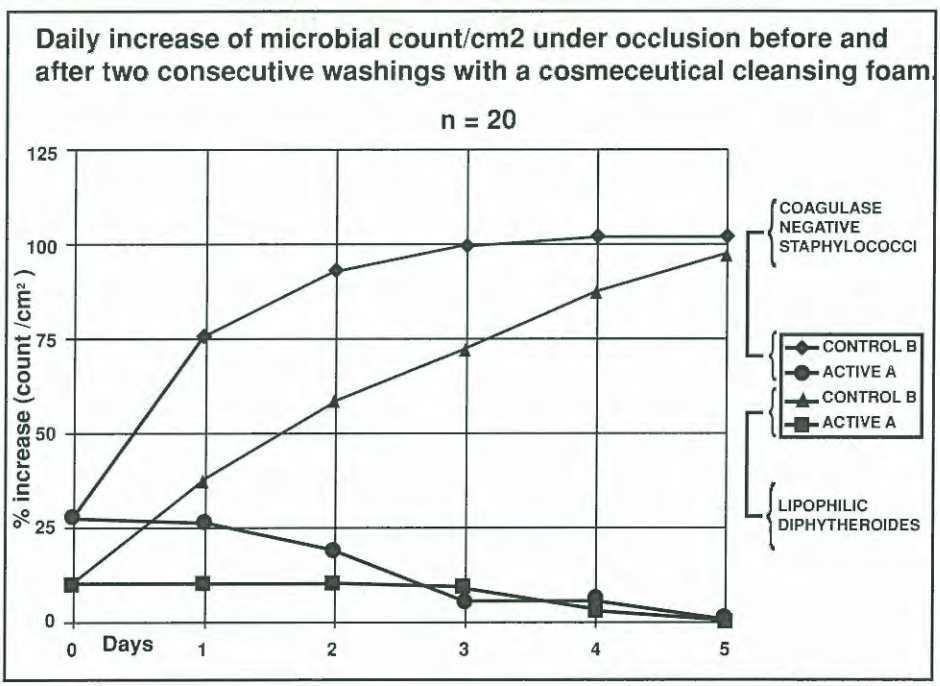
Daily increase of microbial count/cm2 under occlusion before and after two consecutive washings with a cosmeceutical cleansing foam.
n = 20
% increase (count /cm²)
125
100
75
50
25
0
0 Days
1
2
3
4
5
COAGULASE NEGATIVE STAPHYLOCOCCI
CONTROL B
ACTIVE A
CONTROL B
ACTIVE A
LIPOPHILIC DIPHYTHEROIDES

Fig. 3

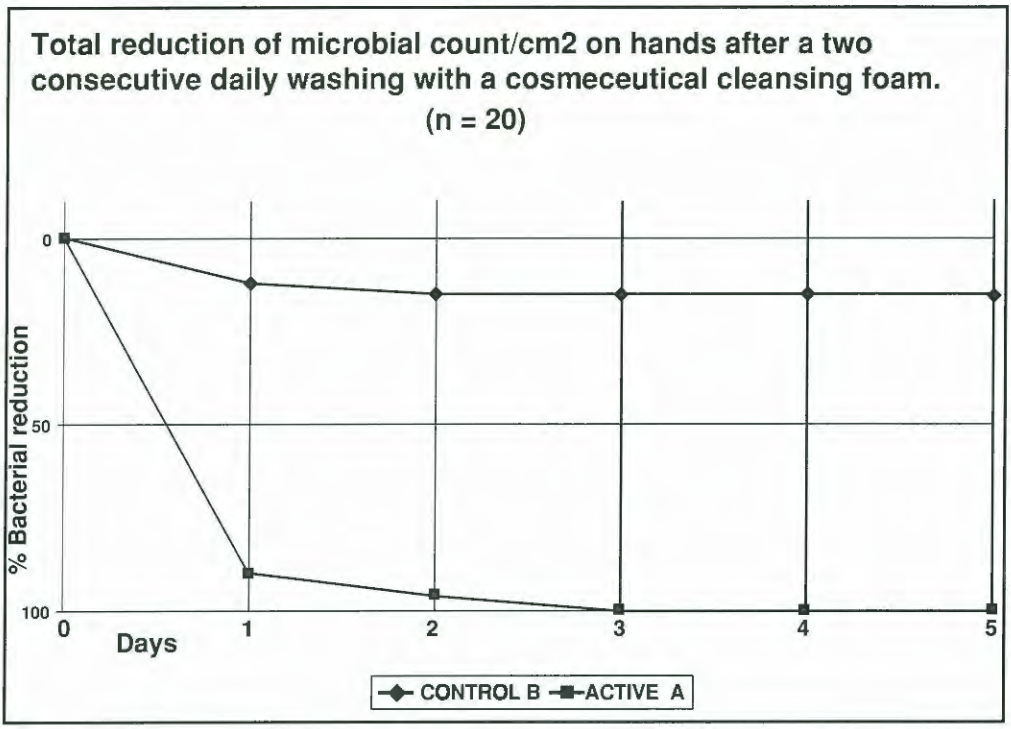

Fig. 4

RESULTS AND COMMENTS

How it is possible to see on tables 1 and 2 the total body washing with the cosmeceutical cleansing foam studied, (MICOSPUMA A) resulted in a marked reduction of the total skin bacteria both after one-day and five consecutive days of treatment, whereas the control foam, as a normal batb, increases the contamination. This phenomenon, reported also by other authors (7-11) seems to be linked to the loss of skin squamae that, together with the escreted lipids, promote the growth of the skin bacteria. The same results are obtained on the skin artificially colonized by staphylococcus aureus (fig.2), which represent the dominant bacterium in early infections following surgical operations. It is also interesting the demonstrated high effectiveness against the fungus pityrosporon ovale (fig.1) associated, with several skin diseases, such as seborrhoeic dermatitis, pityriasis versicolar, some form of atopic dermatitis, etc. (12-14). The effectiveness of this cleansing foam (*Alfa 4 Micospuma®*) seems to increase during the days of usage ranging the 100% of the P. ovale reduction in the first week of treatment. Finally the occlusion test gave also positive results. It is possible to observe (fig. 3) a rapid expansion of the controlled flora during the 5 days of treatment with the control foam, meanwhile the active MICOSPUMA A produces a persistent and continous antimicrobial effect totally eliminating the microflora in 5 days of treatment. The same results can be seen from fig.4 on the hands, following 5 consecutive day washings.

CONCLUSION

In conclusion this new cosmeceutical foam seems to be useful as normal or preoperative to-

tal body washing, beeng effective in reducing the bacterial flora of the skin also in one day use. Moreover beeing an auto-dosable, persistent, moisturizing, non irritating cosmetic preparation designed for frequent use, this micospuma may be used as daily preoperative hand washing to inhibit, to kill or remove pathogenic microorganisms on the skin. It is important to remember that with the right hand-washing product the risk of infection may be reduced for the user and for those individuals who are in frequent contact with people, such as in routine patient care and presurgery. For all these reasons this new cosmeceutical may represent an interesting cosmeceutical for the standard routine body and hand washing of the medical community and the hospitalyzed patients, especially in the surgery departments.

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