



Evaluation of pH of Facial Cleansers Available in the Bangladeshi Market



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Received Date: February 26, 2020 ; **Published Date:** March 16, 2020

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Abstract

Facial Cleansers are integral part of daily skin care and widely used for the maintenance of hygiene and cleanliness. Healthy skin pH range is 5.4-5.9. At this pH, the regular skin bacterial flora is maintained. Facial cleansers with high pH increase skin pH resulting in skin dehydration, irritation and alteration in bacterial flora. The majority of facial cleansers available in the Bangladeshi market do not disclose their pH. The skin of Bangladeshi people is becoming dull, rough and dehydrated. The aim of this study was to evaluate the pH of different brands of facial cleansers available in the Bangladeshi market to get an overview of the effect of these products on skin problems.

Keywords: Facial cleansers; pH; Acid mantle

Introduction

Acid mantle is crucial for healthy skin. Acid mantle is a naturally secreted, thin, protective layer that covers skin. It is composed of oils, lactic acid, amino acids, fatty acids and skin's own natural moisturizing factor [1]. Its pH is between 4.5 and 5.5 [2]. It assists the normal microbial flora of the skin to build up properly and creates a wall that guards against pathogens and outside irritants, as well as against the skin's internal dehydration. A number of key enzymes involved in the creation and safeguarding of a competent skin barrier are largely impacted by pH. Studies have shown that elevations of pH in normal skin creates a disturbed barrier, causes increased activity of serine proteases and reduced activities of ceramide-generating enzymes [1,3].

But acid mantle can be cleaned or scrubbed away, and it can moreover be counterbalanced by cleansers that raise the pH of skin above 6 [4-6]. A tight squeaky-clean feeling after washing is felt on using facial cleansers above this pH range. Scrapping acid mantle away can increase the chances of skin damage and infection. The pH of Facial cleansers varies depending on their composition and even have a pH range of 9-11, which can make skin dry and make it more vulnerable to bacterial development. The acid mantle takes from 15 minutes to 14 hours to restore itself, depending on how much it's been disrupted or damaged

if once damaged [5]. Even use of 'neutral' pH products is not recommended. Because normal flora growth is optimal at acidic pH levels, but pathogenic bacteria, such as *S. aureus*, thrive at a neutral pH levels [6]. So, use of products with a pH of 5.5-6.5 is recommended. It is helpful to maintain the skin's acid mantle. Using cleansers in this pH range is essential in order to maintain hygiene and moisture. If skin care, hygiene and hydration are insufficient, the skin will turn sensitive and dry [7,8]. Hence, a broader view of the importance of pH in relation to function and integrity of the skin is emerging.

Materials and Methods

The pH values of facial cleansers vary depending on their formulation and composition. The increase in pH potentiates skin dryness and poses potential risk of cutaneous reactions. So, we collected facial cleanser samples to check their pH. The samples of facial cleansers were collected from different retail shop and departmental stores of Bangladesh. The sample cleansers of different brands (both Bangladeshi and multinational) were coded before the commencement of the pH analysis. pH was measured using pH meter. The liquid cleansers were weighed at one gram and was made 10% cleansing solutions in tap water in order to resemble the actual usage condition. The pH of tap water was measured 7.02. The pH was measured using

a pH meter (Thermo Scientific Orion 2 Star pH/ conductivity benchtop meter Thermo Scientific, Beverly, MA, USA). The level of uncertainty was ± 0.07 . The pH of each sample was measured thrice to obtain an average value [9-12].

Results and Discussion

Of the 65 samples of facial cleansers tested, 4 cleansers had a pH within the range of 3.01 to 4. Among these four cleansers, two was blackhead clearing facewash and two was daily face wash. Six facial cleansers had pH between 4.01-5. Among these, three were antiseptic face wash, two were mild liquid cleansers and one was daily use face wash. Only five face washes were in the range of pH 5.01-6. Among these, two were ayurvedic purifying facial cleansers, two were fairness facial cleansers and one was ayurvedic fairness face wash. Eight of the 65 samples had pH in the range of 6.01 to 7. Of these, two were acne oil control facial cleansers, four were herbal face washes and two were activated charcoal face wash. Ten samples had pH between 7.01- 8. Of

these, six cleansers were anti acne face wash and rest were facial cleansers. Twelve samples had pH in the range of 8.01-9. Among these, seven were fairness facial cleansers and five were anti-acne face washes. Unexpectedly, twenty samples had pH between 9.01-10. Five of them were men facial cleansers, one was anti acne for men, three were clay face wash, two were charcoal face wash, one was white clay anti acne face wash, one was pollution removing facial wash, three were scrub facial washes and four were brightening facial cleansers.

The results of the study revealed that only 7.69% of the facial cleansers tested had a pH in the range of 5.01-6.0. 12.31% cleansers had a neutral pH. The rest of the products have alkaline pH. These are not also pH labeled. But alarmingly, 30.77% cleansers were in very alkaline pH range of 9.01-10.00. It is observed that man face washes and fairness cleansers have highest pH levels. Herbal face washes usually have slightly acidic or neutral pH.

Table 1: Total number and percentage of facial cleansers samples in the various pH range.

pH: Potential of hydrogen.

pH Range	No. of Facial Cleansers Samples in the pH Range	Percentage of Facial Cleansers Samples in the pH Range (%)
3.01-4.00	4	6.15
4.01-5.00	6	9.23
5.01-6.00	5	7.69
6.01-7.00	8	12.31
7.01-8.00	10	15.38
8.01-9.00	12	18.46
9.01-10.00	20	30.77

Conclusion

The facial cleansers commonly used by the population at large have a pH outside the range of normal skin pH values. As the pH has a vital role on skin health, hygiene and integrity, so the facial cleansers should be chosen carefully. The manufacturers must label the actual pH of the facial cleansers so that the pH remains in control.

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DOI: [10.19080/NAPDD.2019.05.555660](https://doi.org/10.19080/NAPDD.2019.05.555660)

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