***Short communication***

# The Minus One Rule of Hairwash in Monsoon


## ABSTRACT

**Aims:** The Asian subcontinent has a well-defined monsoon season; however, it is still uncertain whether hair loss increases during the monsoon. Scant literature is available on correlation between hair wash frequency and hair loss. This small cross-sectional study aimed to objectively assess whether patients perceived increased hairfall during monsoons. In addition, we aimed to formulate a hairwash frequency schedule to help in reducing seasonal hairfall in monsoon.
**Study design:** Cross-sectional study
**Place and Duration of Study:** Kaya Skin Clinics, New Delhi, India. The Study was conducted from August 2020 till September 2020
**Methodology:** After due consent, 25 females who were experiencing hairfall and not taken any hair salon treatment in the last 3 months were enrolled during the months of August and September. Patients with medical comorbidities and other hair disorders were excluded. A new concept by the name of "minus 1 rule" was formulated where 1 implied 24 hours. A hairwash schedule based on this concept was given for four washes. Hair shed during each wash were collected and a validated Hair Shedding Visual Scale based on hair length was used by the principal investigator to score the samples.
**Results:** Seventy six percent experienced maximum hairfall in monsoon. The mean Hair shedding Visual Scale scores at baseline and the third wash were 5.24±1.82 and 4.32±1.76 respectively and this difference in mean scores was statistically significant (*P* value <0.00001).
**Conclusion:** This study found a statistically significant reduction in hair fall visual scale scores with a hairwash 24 hours prior to the need for a wash during the monsoon season. In addition, we found that majority females reported hairloss during the monsoon season. To the best of our knowledge, this is the first study which has attempted to find a relation between hair wash frequency and hair loss during the monsoon season.



*Keywords: [*Hairloss, monsoon, minus one rule, sweat-itch-oil cycle*}*



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## 1. INTRODUCTION

The Asian subcontinent has a well-defined monsoon season; however, it is still uncertain whether hair loss increases during the monsoons. Most dermatologists practising in the tropics believe that hair loss increases during the monsoons. The common thinking is that people get wet in the rain and the acidic water leads to increased hairfall. However, this belief has not been investigated.

Dermatologists often tell their patients to wash their hair frequently but the frequency of wash with respect to scalp or hair type is seldom specified. A study conducted in southern India on hair cleansing practices reported that 65% individuals washed their hair once a week, 15% washed twice a week, 20% washed once in every ten days and 37% individuals believed that excessive cleansing caused hair loss. [1]

Scant literature is available on the correlation between hair wash frequency and hair loss. This small case series aimed to survey if patients perceived increased hairfall during monsoons in a tropical country. In addition, we formulated a simple rule that could guide patients about hair wash frequency during monsoon season.

## 2. MATERIAL AND METHODS

Twenty five females, 20-60 years of age, who were experiencing hairfall and not taken any hair salon treatment since 3 months were enrolled from routine dermatology OPD during the months of August and September. A written and informed consent was taken from all participants and need for compliance was explained.

After a thorough history, patients with anaemia, hypothyroidism, Polycystic Ovarian syndrome (PCOS), diabetes mellitus, hypertension, other chronic lifestyle disorders, history of weight loss, major febrile illness in the last 6 months or history of drug intake for any lifestyle disorder were excluded. Pregnant, lactating females were not enrolled. Cases of Female pattern hair loss (FPHL), localised scalp and hair shaft disorders were excluded after clinical examination and trichoscopy. Patient's history regarding hair type, scalp type and cleansing patterns was recorded using a structured questionnaire. Thereafter, patients were given a hairwash schedule based on a rule hypothesised by the authors called as the "minus 1" where 1 implied 24 hours. For example, if a patient generally takes hairwash every 72 hours, a schedule with minus 1, that is, every 48 hours was given. Since, dermatologists generally recommend a wash at least twice a week, those with a gap of >96hours were given a schedule of "minus 1.5" (minus 36 hours) while those washing alternate day were suggested to do so in "minus 0.5" (minus 12 hours). The schedule was given for a total of 4 washes (Baseline wash, wash 1, 2 & 3 ).Patients had to use the same shampoo for every wash and were not permitted to use any colour, conditioner, oil, serum or any heating or curling devices during the study period. They were also instructed to comb only after completely drying their hair. Prior to wash, patients were asked to cover the washroom drains with sieve gauze. Hair shed during the wash and in the first combing post wash were collected at baseline and for subsequent three washes. Collected samples were placed on a white tissue after cleaning and drying. Sample images were shared with the principal investigator after every wash. A validated Hair Shedding Visual Scale by Martinez-Velasco et al. based on hair length (long, medium, short) was used by the principal investigator to score the samples. As per this scale, scores were assigned from 1-9 based on number of strands in a hairball of 10 to 700 hair respectively. [2]

### 2.1 STATISTICAL ANALYSIS

Descriptive data was expressed as means ± standard deviation. Categorical data was expressed in terms of percentage. Hair shedding scale scores between baseline and the third hairwash were compared using paired T-test. Multivariate linear regression analysis was applied to find association between age, scalp type, hair texture, hair type, suggested gap for hairwash and the hair shedding scores after third wash. P-value of < .05 was considered statistically significant. Analysis was done using SPSS version 20.0.

## 3. RESULTS AND DISCUSSION

### 3.1BASELINE CHARACTERISTICS OF STUDY SAMPLE

The mean age of the patients was 32.76 ± 10.14 years. Of the 25 patients, 76% experienced maximum hairfall in monsoon, 16% in summer and 8% in spring. Sixty eight percent said that their hair fall was least during winters. The mean gap between two hair wash was 78.72 ± 22.2 hours. Clinical profile of patients is provided in table 1. Prior to enrolment, 36% individuals mentioned that they postponed their hairwash out of laziness. On asking for any two of the five parameters as motivating factors for the next wash, 60% said that they took the next wash when their scalp turned oily. Hair turning limp and frizzy (44% cases), excessive sweating (24% cases), an itchy scalp (20% cases) and dandruff (12% cases) were the other reasons given.

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**Table1. Clinical profile of enrolled patients**

| | |
|---|---|
| **Scalp type** | 32% oily<br>24% dry<br>24% mixed<br>20% normal |
| **Hair type** | 40% wavy<br>36% straight<br>24% curly |
| **Hair length** | 32% long<br>28% medium<br>40% short |
| **Hair texture** | 8% thick hair<br>60% medium thickness<br>32% fine |
| **Shampoo used during the study period** | 64% used cosmetic shampoo (with various anionic and amphoteric ingredients)<br>24% used a natural herbal shampoo<br>12% used a medicated antifungal shampoo |

## 3.2 COMPARISON OF HAIR SHEDDING SCALE SCORES FROM BASELINE AND THIRD WASH

The mean Hair shedding Visual Scale scores at baseline and at the third wash were 5.24±1.82 and 4.32±1.76 respectively. The difference in mean scores between baseline and 3$^{rd}$ wash, using paired T-test, was statistically significant (*P* value < 0.00001) [Figure 1 & 2].

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**Figure 1.**Shed hair was cleaned, dried and collected on a white tissue paper post hair wash "Baseline, 1, 2 & 3 respectively and images were shared with the principal investigator for scoring by Hair Shedding Visual Scale

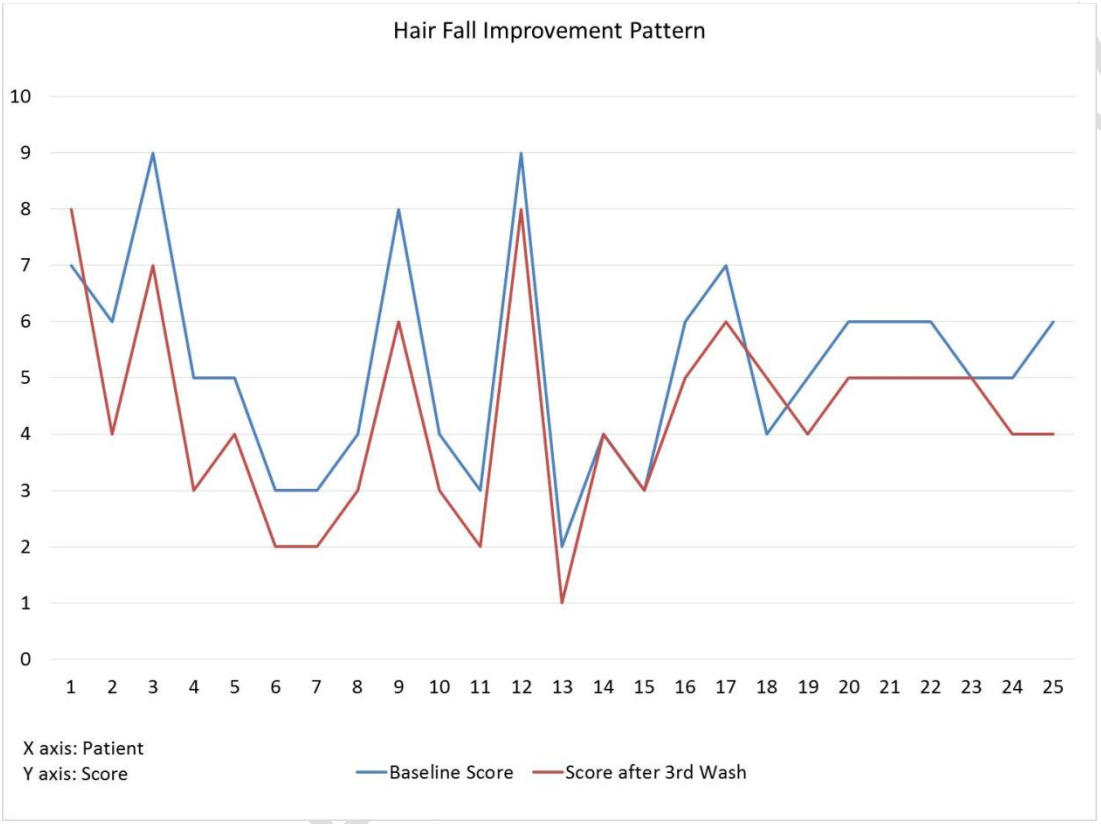


**Figure 2.** Patient wise scores on Hair Shedding Visual Scale and comparison of scores between baseline wash and wash 3.

### 3.3 ASSOCIATION BETWEEN SUGGESTED HAIRWASH GAP AND HAIR SHEDDING SCORES POST THIRD WASH

Using multivariate linear regression analysis, we found that the suggested gap according to "minus 1" rule was significantly associated with the final hair shedding scores was (*P* value < .011) [Table 2]

**Table 2. Multivariate analysis to determine independent predictors of final hair shedding scale scores**

| Independent variables | Estimate | Standard error | t-statistic | *P*-value |
|---|---|---|---|---|

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| | | | | |
|---|---|---|---|---|
| **Suggested gap** | 0.0747 | 0.0265 | 2.8145 | **0.011*** |
| **Age** | 0.0079 | 0.0359 | 0.2211 | 0.827 |
| **Hair type** | -0.2495 | 0.4208 | -0.5929 | 0.560 |
| **Scalp type** | -0.3603 | 0.344 | -1.0473 | 0.308 |
| **Hair texture** | 0.8258 | 0.6001 | 1.3761 | 0.185 |

***-denotes significant**

### 3.4 DISCUSSION

This study was conducted to ascertain whether hairloss actually increases in the monsoon season and whether the "minus one" rule of hairwash could reduce this hairfall. According to a recent study which analysed Google trends data between 2004-2016 for various seasons, the search volume index(SVI) of hair loss across 10 countries was maximum in summers and in the summer-fall transition.[3,4] Courtus et al. prospectively observed annual periodicity of hair loss among patients for a period of 8-14 years and reported a telogen maxima at the end of summer and a minima in winters.[5] Kunz et al too reported a maximum telogen peak in July with shedding in subsequent months.[6] In our study, 76% of patients reported maximum hair fall during the monsoon season which is in line with the above studies.[3,5,6] Increased hairfall during monsoons has been explained as an evolutionary adaptation in humans, where a head full of hair is needed for thermal insulation during winters. As the day gets longer in summer, telogen phase sets in and telogen hair then continue to protect man from the scorching sun of summers with a late telogen release at the end of summer or early fall. This period overlaps with the monsoon season in tropical countries. Furthermore, temperature and sun exposure, through the hypothalamo-pituitary axis system triggers production of steroid and thyroid hormones, impacting hair cycle. [7,8]
However, increased hair loss at the end of summer has been reported by the above studies in temperate countries lacking a definite monsoon season. Our study was conducted in a tropical country with a monsoon season and there may be other plausible mechanisms behind increased hair fall specific to our setting. It is well known that one sweats more in humid weather and sweat has a hard time evaporating in humid weather. [9]Hence, it is unable to cool the skin and makes the skin and scalp sticky. Subsequently, sebaceous glands function more in humid weather in order to counteract dryness caused by increased sweat evaporation. [10] This soothes and nourishes the scalp initially; however the sebaceous secretion eventually increases itch as triglycerides in the sebum produce highly irritating free fatty acids(FFA) in the presence of bacterial hydrolases. [11,12] Furthermore, increased stress of summer and humidity results in peaking of testosterone and CRH levels which stimulate sebaceous glands, making the scalp oily and causing more follicles to enter the telogen phase in summers with subsequent shedding in the monsoon season.[7,13] Dust, hair care products and secretions accumulate, leading to residue formation accelerating hairfall. [14] Even in our study, majority patients said that they washed their hair after scalp turned oily, itchy or after hair lost moisture and became frizzy. The "minus one" rule was thus hypothesised based on the idea that if scalp is washed before the 'sweat-itch-oil cycle' sets in, hairfall may reduce.
We found a statistically significant reduction in hair shedding visual scale scores with a suggested hairwash gap 24 hours prior to the need for a wash. Using multivariate linear regression analysis, we found that the reduced hairwash gap was a significant predictor of final hair shedding scores independent of scalp, hair type and hair texture. Hence, this reduced gap (determined by the "minus one" rule) probably helped in breaking the environment triggered secretory cycle.
However, this is a small case series and larger studies with control participants are needed to further validate our findings.

### 4. CONCLUSION

In conclusion, greater hairfall was perceived during the monsoon season in a tropical country like ours. In addition, reducing the hairwash gap by 24 hours according to the "minus one" rule resulted in a significant reduction in hairfall scores. The minus one rule can be a handy tool for the dermatologist to guide patients how often to wash their hair along with other measures to counteract hairfall during monsoons. To the best of our knowledge, this is the first study from India which highlights that increased hairfall during the monsoons is not just a belief but a fact.

### COMPETING INTERESTS DISCLAIMER:

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Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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## CONSENT (WHERE EVER APPLICABLE)

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this manuscript and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal."

## ETHICAL APPROVAL (WHERE EVER APPLICABLE)

Not Applicable

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