

## REVIEW ARTICLE ON ROLE OF FIRECRACKERS AS CAUSATIVE FACTOR OF PRATISHYAYA IN INDIA

<sup>1</sup>Dr. Milind B. Aware, <sup>2</sup>Dr. Bhavana Dande and <sup>3</sup>Dr. Amit S. Ahire<sup>1</sup>Principal, Guide and HOD, Ayurveda Samhita and Siddhant Department, SSAM, Hirawadi, Nashik.<sup>2</sup>Associate Professor, Ayurveda Samhita and Siddhant Department, SSAM Hirawadi, Nashik.<sup>3</sup>PG Scholar, Department of Ayurveda Samhita and Siddhant, SSAM, Hirawadi, Nashik.

\*Corresponding Author: Dr. Milind B. Aware

Principal, Guide and HOD, Ayurveda Samhita and Siddhant Department, SSAM, Hirawadi, Nashik.

Article Received on 14/10/2024

Article Revised on 03/11/2024

Article Accepted on 23/11/2024

## ABSTRACT

India has always been an agriculturally dominant country meaning the highest percentage of its citizen are dependent on agriculture. In the months of October, November, monsoon is on the decline, new seasons plantation is over by then. These festivities in ancient times were used to bring people together in leisure times, to renew hope for the next season. The biggest and foremost festival in these months is Dipawali; the festival of lights which is celebrated by lighting oil lamps, sharing sweets, and greetings. In the 21<sup>st</sup> century, this festival of lights is dominated by bursting fire crackers. In this review article we look at this fire cracker bursting tradition in ayurvedic light as a cause of Pratishyaya.

**KEYWORDS:** Pratishyaya, Firecracker, pollution, Shiroabhitaapa.

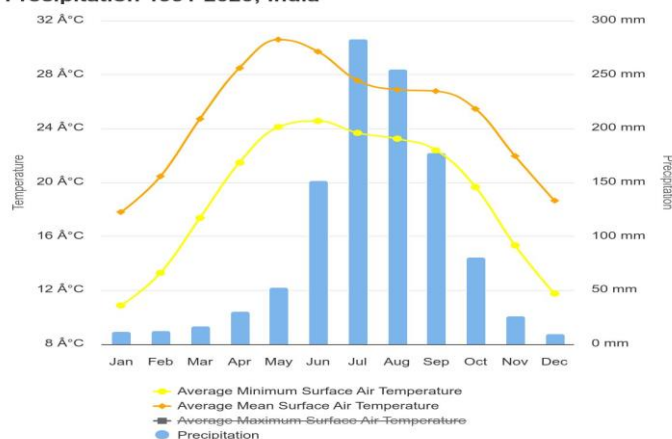
## INTRODUCTION

India is a geographically unique region. It is surrounded by Himalayan mountains in north, Peninsular Deccan Plateau, the Indo Gangetic Plains, Thar Desert in west, Coastal plain and islands. This uniqueness vastly influences Indian weather. The coastal regions of the country have warmer temperature, the northern part

experiences hot summers and cold winters. This vast temperature difference is responsible for 3 types of marked seasons in India i.e. summer, winter and monsoon.

Average temperature by month.<sup>[1]</sup>

Monthly Climatology of Average Minimum Surface Air Temperature, Average Mean Surface Air Temperature & Precipitation 1991-2020; India



The months of November, December, January, February are considered as Winter season in India ranging average minimum surface air temperature from 13 – 11 degrees Celsius. It is stated by ideal gas equation that,

temperature decrease is inversely proportionate to air density.<sup>[2]</sup> Meaning if temperature is decreased, air becomes denser. This dense air precipitated nearer to surface compared to hot air which occupies higher layer.

Fire crackers originated in China in 2<sup>nd</sup> century B.C. the first natural firecrackers were bamboo stalks when thrown in fire, would explode with bang considered to ward off evil spirits. In the period of 600-900 AD, first gun Powder was created therefore making artificial fireworks. They got popularized in Europe in 13<sup>th</sup>- 15<sup>th</sup> century in day-to-day usage. Now widely used in India and almost all countries.<sup>[3]</sup>

These firecrackers are mainly made of 10-20% of Potassium Perchlorate, 35-50% of Barium Nitrate, 1-8% Perlite powder, 5-20% of Magnesium aluminum alloy, 3-15% of aluminum powder, 10-25% of Titanium powder and 3-10% of Brim Stone. Burning the firecrackers release pollutants like Sulphur dioxide, potassium nitrate, charcoal, carbon dioxide, carbon monoxide, Suspended particles below 10-micron diameter, aluminum, manganese cadmium.

In months of winter season, the air comprising with above mentioned elements in higher concentrations are inhaled. This inhaled contaminated air causes irritation to mucosa.

**Pratishyaya:** Pratishyaya<sup>[4]</sup> is explained as tendency of Kapha avrutta Udaan vata coming from nasa.

#### Hetus<sup>[5]</sup>:

- 1) Vega vidharana- Holding of 11 Adharaniya Vega
- 2) Ajirnaa- Indigestion
- 3) Raja- Exposure to dust
- 4) Ati bhashya- Excessive talk
- 5) Krodha- Anger
- 6) Rutuvaishyama- Change of season
- 7) Shirobhitaapa- factors irritating shirastha avayavas
- 8) Prajaaganam- excessively being awake
- 9) Atiswapana- excessive sleeping
- 10) Atisheeta ambusewana- drinking of chilled water
- 11) Shitavashya – roaming in cold weather
- 12) Maithuna- indulgence in sexual activity
- 13) Bashpa dhooma vashyaya- roaming in humid foggy weather.

**Types:** Pratishyaya is of

- A) Vaataja
- B) Pittaja
- C) Kaphaja
- D) Raktaja
- E) Sannipataja

**Samprapti:** There is no separate Samprapti mentioned in Ayurvedic texts for Vataja Pratishyaya. So, this Samprapti takes place when causative factors are mainly Vata vitiating that causes Vataavidhi. Here Kapha, Pitta, and Rakta get vitiating with their own etiological factors and they obstruct the Gati of Vata causing Avarana of Vata and leading to Urdhwagamana i.e., Pratiloma Gati of Vata. Doshas get lodged in Shira Pradesh. Thus, giving rise to the disease.

**Purvaroopas:** Purvaroopas described by Sushruta include

- Shirogurutwa (Heaviness of the head)
- Kshavathu (Sneezing)
- Angamarda (Bodyache)
- Parihrishtaromata (Generalized horripilation)
- Stambha (Stiffness)

Here the clearest indication of Pratishyaya is explained as cold air exposure, roaming in humid foggy weather. In the months of winter season, already cold air comprising of humidity/ water vapour is further added with irritants by firecracker soot. This additionally causes Shiro - Abhitaap in addition to shitavashya, rutuvaishyama, raja causing increased irritation to mucosa and resulting in Pratishyaya.

#### CONCLUSION

Pratishyaya is caused by Rutuvaishyama, Shirobhitaapa, Atisheeta ambusewana, shitavashya and Bashpa dhooma vashyaya according to Charaka Samhita.

The air density in the months of winter season is higher compared to other seasons in India. This causes denser air with more Parts Per Million (PPM) to be inhaled. The months of Winter season are highlighted by festival of light, Dipawali. After invention of firecrackers, Dipawali which was celebrated by lighting lanterns and exchanging gifts & sweets is dominated by bursting firecrackers. Bursting of firecrackers releases pollutants like Sulphur dioxide, potassium nitrate, charcoal, carbon dioxide, carbon monoxide. These pollutants cause irritation of Shirasa i.e. shiroabhitaapa. The amalgamation of these hetus cause Pratishyaya.

#### RESULT

Burning and bursting of firecrackers causes Shiroabhitaapa causing Pratishyaya.

**Conflict of Interest-** None

**Sponsor -** None

#### REFERENCES

1. <https://climateknowledgeportal.worldbank.org/country/india/climate-data-historical>.
2. <https://www.basicairdata.eu/knowledge-center/background-topics/density-and-air-temperature>.
3. American Pyrotechnics Association/ History of Fireworks.
4. Google Patents CN101633592A – Formula of Firecracker.
5. Sushruta Samhita Nibandhasangraha Tika by Dalhanacharya Uttartantra/22/15.
6. Charaka Samhita chikitsaasthaan Tika by Chakrapanidatta 26/102.