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### Research Article

#### EPIDEMIOLOGICAL STUDY ON DADRU IN KOLKATA, WEST BENGAL, INDIA

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#### ABSTRACT

Background-Dadru is one type of kustha which manifests in skin mainly irrespective of age & sex, whose description resembles ringworm or dermatophytosis. In modern science the clinical manifestation of dadru is closely similar to local infection/ tinea infection which is affecting 15% of population. Dadru comes under oupasargika roga. It is contagious, spread person to person by malaja krimi through sweda (contact with infected person, contact with clothes of infected person). Methods-the method used is a survey method with cross sectional approach, with a total sample 103 patients. The epidemiological characteristics of respondents surveyed consisted of the characteristics (santarpanaja nidan, gender, knowledge, occupation & personal hygiene), the characteristic of the place (population density), and the characteristic time diagnosed (months). Results-The results showed that the epidemiological characteristics of dadru were more in female sex (65.04%), with low elementary education (87.37%), had less knowledge about disease (76.69%), did not maintain personal hygiene enough (57.28%), excessive intake of santapanaja nidam (91.06), residential density had not qualified (88.34%) and most likely diagnosed in the period of June to August (57.27%). Conclusion-The incidence of dadru in Kolkata are increasing day by day. So, proper treatment protocol is needed to treat these patients. In Ayurveda, different types of preventive measures including dincharya have been mentioned to prevent spreading of oupasargika roga. All these preventive measures can be applied in prevention of dadru.

**Keywords:** Epidemiology, dadru, oupasargik roga or sankramak vyadhi, santarpanaj nidan.

#### INTRODUCTION

Twaka or skin is the largest organ and most visible organ in human body which exudates various physiological functions and it also prevents invading pathogens<sup>1</sup>. Any disease related to skin can create physical as well as psychological problems in an individual. Common psychological problem associated with skin disease include feelings of stress, anxiety, anger, depression, shame, social isolation, low self-esteem and embarrassment. Skin diseases are mostly caused by infections like bacteria, fungi etc. In Ayurveda fungal infection of skin is termed as dadru. Acharya Charaka has explained it under ksudra kustha<sup>2</sup>, but Acharya Sushruta has explained it under mahakustha<sup>3</sup>. Dadru kustha is spreading in nature. It spreads one person to another person by bahyamalaja krimi through sweda (contact of skin, sharing skin etc.)<sup>4</sup>. Clinical features of dadru kustha are kandu (pruritus) pidika (eruption), and utsanna mandal (elevated circular skin lesion)<sup>5</sup>. It is tridosha vyadhi with predominant vitiation of pitta & kappa dosha<sup>6</sup>. Multiple area can be affected at a given time. Intake of incompatible and contaminated food, suppression of natural urges, drinking cold and chilled water just after exposure to sunlight or after doing physical work, daytime sleep & excessive intake of salty and amla food are described as the causative factors of this disease<sup>7</sup>.

On the basis of clinical appearance, dadru kustha is mostly simulates with 'dermatophytosis'. It is a common health problem in developing or tropical countries like India and depending on epidemiological factors and Geographical area. Dermatophytes (species of fungi belonging to genera Trichophyton, microsporum or Epidermophyton which are referred as a tinea) are a group of closely related fungi that have the capacity to invade keratinized

tissue (skin, hair, and nails) of humans and other animals to produce an infection, dermatophytosis, commonly referred as ringworm. Overall, dermatophytosis is more prevalent in women than in men. Dermatophytosis is a non-fatal, superficial infection of the skin. It may reach epidemic proportion in some areas. Despite increasing reports of dermatophytosis in different tropical and subtropical countries, there is scanty data on this issue from India especially from West Bengal which is situated in the eastern part of India<sup>8</sup>.

This present study was undertaken with the objectives to determine the incidence, contributing factors associated with dermatophytosis and occupation consequences related to diseases. Also, it had been tried to isolate and characterize the causative dermatophytes and species prevalent in this part of country.

#### EPIDEMIOLOGY

Dadru kustha in terms of dermatophytosis are common in most adult people, with up to 20% of the population having one of these infections at any given moment. Dadru comes under oupasargika roga. Sankramaka or Aupasargika roga nidam are described by Acharya Susrut. Prasangat (sharing), gatrasansparsat (physical contact with disease person), bastrmalya anuleponat (sharing of contaminated clothes & garlands in terms of jewelry, makeup kit etc.) are nidam of dadru. Apart from these the prevalence of the dadru depends on the host and geographical location, health care, immigration, climate (temperature, humidity, wind, etc.), overcrowding, environmental, hygiene culture, awareness to dermatophytes, age of individuals, hygiene and socioeconomic

status. Several factors have been implicated to increase in disease such as trauma, increased sweating and diabetes<sup>9</sup>.

The factors, which responsible for dadru kustha (dermatophytosis) evolve along with the change in geography and socio-economic condition. These Keratinophilic fungi have ability to invade hair, nails and skin of the living host. Worldwide, the prevalence of dermatophytosis is 20000-25000 per 100,000 persons. The superficial mycotic infection worldwide in all group according to WHO in 2015 has been found to be 20%-25%<sup>10</sup>. Its prevalence varies in different countries<sup>11</sup>. It is more prevalent in tropical and subtropical countries like India where the heat and humidity are high for most part of the year<sup>12</sup>. In India in last to 7-8 years, there has been rapid hike in recurrent, difficult to treat (kricha Sadyha) & chronic dermatophytosis. A study had been conducted in Sikkim, India in which 60.4% of patients were suffering from recurrent dermatophytosis<sup>13</sup>.

In Kolkata, presence of hot & humid climate (lead to excessive sweating in summer), over-crowding population, low socio-economic status, sharing of contaminated clothes & shoes, maintenance of improper hygiene and migration of poor people from villages leads to recurrence of dadru in terms of dermatophytosis.

## MATERIAL & METHODS

It was survey method with cross sectional approach to describe the epidemiology of dadru patients in Kolkata conducted among the patients, who had attending the outpatient door of institute of post graduate ayurvedic education and research at Shyamadas Vaidya Shastra Pitha Hospital, Kolkata, West Bengal, India. The study recruited patients over one and half years from April -2017 to August-2018. A total of 103 patients were included in study with presence of proper sign and symptoms of dadru kustha. Institutional ethical clearance (SVP/558/2017) was taken, and all patients participated after signing informed consent form. Patients were coming from densely populated metro city of Kolkata along with suburban area surrounding with it, but majority of the people are coming from rural areas with low socioeconomic background and poor lifestyle rate.

## OBSERVATIONS & RESULTS

A total 103 cases of clinical dadru infection were included in the study. Among them 67 (65.04%) patients were female, and 36 (34.95%) patients were male.

The result of this study has been described in the following form of epidemiological overview i.e. intake Santarpanotta nidan, characteristic gender, knowledge, work and personal hygiene of the patients.

**Table 1: Prevalence of santarponnottha nidana (dietary factors)**

<b>Availability of Ahara Nidan</b>	<b>No. of patients (n=103)</b>	<b>%</b>
Dhanya (cereals & pulses) Pistanna, Maida, & its preparation, masha (urad/black gram & its preparation e.g-idli, dosa, dhokla etc.)	84	81.55
Mamsha Varga (non-veg) Gramyaudakauparasa(meat soup of domestic, aquatic animals such as pork, buffalo, fish etc.)	93	90.20
Madya Varga (drinks) Fresh alcoholic drinks which is not having premium quality	38	36.89
<b>Junk foods</b> e.g. pizza/ burger/snacks/spicy food	86	73.49
<b>Availability of Viharaja Nidan</b>	<b>Number of patient (n=103)</b>	<b>%</b>
Avyayam (lack of exercise and physical activities)	98	95.14
Divaswapna (sleeping in the Day time/ inappropriate time)	103	100
Tyaktaachinta (abstinence from mental work/worry)	100	97.08

Based on the distribution of Santarpanotta nidana in table 1 shows that the greatest number of patients are habituated to take santarpanotta nidana. Example in case Ahara nidan distribution were pistanna (81.55%), mamsa bhakshana (90.20%), in

consumption alcohol (36.89%) and consumption of junk food (86.00%); incase, of viharaja nidan distribution were Avyayam (95.14%), Divaswapna (100%), & Twakatachinta (87.08%).

**Table 2: Distribution of respondents according to gender, occupation, Knowledge and Personal Hygiene in Kolkata**

<b>Gender</b>	<b>Number of Patients (n=103)</b>	<b>%</b>
Male	36	34.95
Female	67	65.04
<b>Total</b>	<b>103</b>	
<b>Education</b>	<b>No. of patients (n=103)</b>	<b>(%)</b>
Primary level	53	51.45
Secondary level	37	35.92
college level	13	12.60
<b>Total-</b>	<b>103</b>	
<b>Knowledge</b>	<b>No. of patients (n=103)</b>	<b>%</b>
Enough	24	23.30
Less	79	76.69
<b>Occupation</b>	<b>Number of patients (n=103)</b>	<b>%</b>
Office employee	16	15.53
Housewife	41	39.80
School going	8	7.76
Labor	38	36.89
<b>Maintenance of proper hygiene</b>	<b>Number of patients (n=103)</b>	<b>%</b>
Enough	44	42.71
Less	59	57.28
<b>Total</b>	<b>103</b>	

Based on the gender distribution in table 2 shows that the female respondents were most affected by dadru kustha 67 or 65.04%, while male sex were 36 in number or 34.95%. respondents, who had less knowledge as much as 53 people (51.45%), while respondents who had sufficient knowledge of as many as 47 people (48.52%). Among the respondent's housewife were most in number 41 or 39.80 %. Labor were 38 in number or 36.89%.

Respondents, who have poor personal hygiene as much as 59 or 57.28%, while respondents who had sufficient personal hygiene as many as 44 people or 42.71%.

Residential density characteristic, diagnosis time of dadru kustha in Kolkata.

**Table 3: Distribution of respondents according to the density of occupancy, time of diagnosis in Kolkata**

Density of occupancy	Number of patients	%
Qualify	91	88.34
Non qualify	12	11.65
<b>Total</b>	<b>103</b>	
Time (divided in into 6 segments)	Number of patients (n=103)	%
April 2017- June 2017	25	24.27
July 2017-September 2017	11	10.67
October 2017 -December-2017	9	8.73
January 2017 - March -2018	7	12.60
April 2018 - June- 2018	34	33.00
July-2018 -September.2018	17	16.50
<b>Total</b>	<b>103</b>	

Table 3 shows that of the 103 respondents 91 men (88.34%) who had not eligible dwelling and there are 12 patients or 11.65% who had qualified occupancy. Distribution of respondents enrolled at most in the period April to June 2017 & 2018 with dadru patients (24.27% & 33.00%). While the distribution of respondents enrolled in least in number that was the period from July to September 2017 & 2018, October – December 2017 & January 2017 to March 2018 respectively amounted with 11 (10.67%), 17(33%), 9 (8.73%) & 7(16.50%) patients.

## DISCUSSION

The epidemiology of superficial skin infection (dadru) has changed significantly in the last century and reflects changes in socioeconomic condition, lifestyle and migration. Few studies have investigated the etiology of superficial skin infection (dadru) infection in the developing country like India and consequently, there is less knowledge of any changes to their epidemiology. Reliability of incidence & prevalence of different skin diseases due to superficial mycoses in different demographics of the world are doubtful because studies in one province of a country cannot portray the diseases scenario of that diseases of the whole country. The higher incidents are of dadru in terms of dermatophytosis could be attribute to environmental conditions. The presently studied area most of the residents are the labors and housewife. The nature of job, personnel hygiene and the climatic condition could have been the reason for dermatophytic fungi induced dermatophytosis.

Characteristic of santarpnottha nidana and its relationship with the nature of exposure and degree of vulnerability of its own role. Kustha is the santarpananaja and apatarpanaja vikara<sup>14</sup>. Due to intake of Santarpanaja Nidan Ajirna is produced & consequently krimi also produced (nidanarthakara roga)<sup>15</sup>. Atisthulata (obesity) is also responsible for infection. Structural variations such as skin folds, presence of sebaceous glands, altered thickness in stratum corneum, presence of vellus hair follicle involvement play important role in progress and continuance of infection. Host factors such as site of infection, skin- barrier, age, obesity, immunocompromised disorders, topical administration of steroids, or other immunosuppressive medication may have an effect in spreading of infection and these above-mentioned factors can also alter clinical presentation of dadru<sup>16</sup>.

The prevalence among the females is about-65.04% & among the males is about 34.95%. The female preponderance in present study is observed higher than the males in Kolkata and occurs most frequently in hot climates. This preliminary attempt has given a clear picture about dadru kustha in Kolkata. Kandu (pruritus) pidika (eruption) and utsanna mandal (elevated circular skin lesion) are the symptoms of dadru kustha<sup>17</sup>. Changings fashion trends, and tight-fitting clothing such as figure-hugging denims, leggings and jeggings are increasingly preferred by youngsters who do not pay heed to practical aspects like their non-suitability to our hot and humid climate. This may be correlated with the occupational hazards related to their nature of work and frequent interaction with different people of the society. The higher incidence in females may be also due to the lack of orientation about their health.

Table 2 shows that the knowledge Dadru is low in Kolkata. Only 13 (12.60%) patients, who had a college education level. Most of them were housewife (most of them were involved in different working sector) / labor (total 79 or 76.69%). Education level in areas far from the city or slum areas of Kolkata are still much lower than the city. They did not know Dadru Kustha is Sankramaka vyadhi<sup>18</sup>. Economic factors and lack of awareness of the importance of education of rural communities to be one importance cause of problem.

Table 2 also shows that, respondents, who have poor personal hygiene as much as 59 or 57.28%, while respondents who had sufficient personal hygiene as many as 44 people or 42.71%. Personal hygiene is an act to maintain the cleanliness and Health of persons physical and psychological well-beings. In addition, lack of self-care (a condition where a person is unable to maintain personal hygiene), surrounding environment like storage, closet of clothes, bedding etc. also affects a person's health to some extent. Dadru is a samkramaka vyadhi (contagious disease) and can be passed through skin to skin contact by sharing combs, personal care items, or clothing. There is a probability of ring worm infection even after coming in contact with locked room. The skin infection may transmit from pets to human. Cats are common carrier<sup>19</sup>.

Table 3 shows that of the 103 respondents 91 men (88.34%) who had not eligible dwelling and there are 12 patients or 11.65% who had qualified occupancy. A place can be classified as a specific area of region such as village, sub- district, district etc. The

relationship between disease and occupancy shows that cause can be related to the location of residency of patients<sup>20</sup>.

Table 3 shows that distribution of respondents enrolled at most in the period June to august 2017 & 2018 with dadru patients (24.27% & 33.00%). The relationship between time and the disease is a basic requirement in the analysis epidemiology<sup>21</sup>. Because the changes according to the time of disease showed a good etiologic factor changes in short time, period and secular. It occurs most often in warm, moist climates. It is more likely to you, when you have frequent wetness, such as from sweating, and minor injuries in skin, scalp or nails. June to August months had excessive temperature in Kolkata. Humidity also presents in weather.

## CONCLUSION

This present study has given a clear vision about the etiological factors of Dadru kustha in Kolkata where the climatic condition, occupation, socio-economic status, lower literacy rate and lack of awareness towards diseases plays crucial role for occurrence as well as chronicity of disease Distribution of Dadru kustha in Kolkata are increasing day by day, prevention is one of the measures to reduce the spread of the diseases. So, physicians treating this dadru kustha should make their patients well informed about the disease from all aspects and motivate them to follow proper dincharya, healthy diet & other precautionary measures to prevent spreading of dadru kustha.

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