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Association of *Rukhsha Ahara- Vihara* as a causative factor *(Hetu)* in patients of *Sandhigata Vata*: a case control study.

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Abstract :

Today is the era of modernization and fast life. Human beings are falling prey to various lifestyle disorders, in which defects in food play a major role. Advancement of busy, professional, and social life, improper sitting posture in offices, continuous work in one posture, and overexertion, with reference to the *Dinacharya* and *Rutu charya* the norms of daily routine in present-day situation, are quite contradictory. One such disorder is *Sandhigata vata*. As this disease is chronic in nature, food, lifestyle and medicine have an influence on relieving and aggravating the symptoms of *Sandhigata vata. Sandhigata Vata* is mainly a disorder of old age group, and due to today's lifestyle; it is taking a more complex form. It is a degenerative disease. In *Ayurvedic chikitsa hetu* has so much importance, If the *hetus* are known, the way of treatment becomes easy. In classical *Ayurvedic* texts no specific *Nidana* has been explained for *Sandhigata vata.* Therefore, the general *hetu* of *Vatavyadhi* can be considered. Among such *hetus*, *ruksha ahara vihara* is also a *hetu* for the aggravation of *vata*. The study is an attempt to find an association of *ruksha ahara vihara* as the *hetus of sandhigata vata* which are not directly mentioned in *samhitas*. On the basis of a case-control study, an attempt is made to find out some *hetus* of *sandhigata vata.*

Keywords – *hetu , sandhigatavata ,Nidana, Vatavyadhi, Dinacharya*

Introduction

Among *Gata vata vyadhis*, *Sandhigata vata* is most commonly encountered condition which can be correlated to Osteoarthritis (OA). This is a predominantly degenerative disease that involves peripheral joints in which there is damage to cartilage as well as overgrowth of the bone[1].

Sandhigata Vata is mainly a disorder of old age group, due to today's lifestyle; it is taking more complex form. It is

degenerative disease in which limitations of joint occurs. It is commonly found in weight bearing joints. The *gunas of Vata are Ruksha, Sheet, Laghu, Sukshma, Vishad and Khara*[2]. When we take the *nidan* which make these guna increases then *Vata* becomes more vitiates and makes the *Asthi dhatu* emaciated. By consuming the *Vata prakopaka nidan*, the Shleshak Kapha, present in joints is diminishes and by which *Chala guna* of joints decreases. *Sandhigata vata* is one of the most common *vata*vyadhi which can be correlated with osteoarthritis, the prevalence rate of osteoarthirits is total or 14.8% in which knee osteoarthiritis is 10.8% Which is more than other. Its prevalence in India is 22% to 39%. OA will impact at least 130 million individuals around the globe by the year 2050.[3]The prevalence of OA increases with age; such that by 65 years 80% of people have radiographic evidence of O A, though only 25-30% are symptomatic[4]. OA most commonly affects the hands, lower back, neck and weight bearing joints such as knees, hips and feet[5]. The major risk factors associated with the knee joint OA are age, female sex, obesity, non-smoker, occupational knee bending, physical labour and chondrocalcinosis. Knee joint OA may involve predominantly medial femorotibial, lateral femorotibial or patellofemoral compartment[6].

In *madhav nidaan sandhigata vata* is described as *hantisandhigata: sandhinshool atopkarotich* which means this diseases damaged joints having symptoms like pain sensation,crepitation at joints. It is commonly seen in elder age, which hampers day to day life activity like walking, bathing , gait etc.[7].

In *Ayurvedic chikitsa hetu* has so much importance. Why the disease is caused? It is ruled out on the basis of *hetu.* In classical *Ayurvedic* texts no specific *Nidana* has been explained for *Sandhigata vata*. Therefore, general *hetu* of *Vatavyadhi* can be considered as etiological factors responsible for causing *Sandhigata vata*. Common *Hetus* (etiological factors) of *Vatavyadhi*, which are mentioned by *Acharya Charaka* are as below:

AHARAJA*: *Atiruksha (Excessive dry), *Atisheeta* (cold), *Atialpa* (very less quantity), *Atilaghu* (very light), *Abhojana* (no food intake)

VIHARAJA*: Atiprajagarana* (no sleep), *Divasvapna* (sleeping in day), *Ativyavaya* (excess sexual act), *Vegasan dharana* (stopping natural urges), *Plavana* (swimming), *Atiadhva* (excess walk), *Ativyayama* (excess exercise) .

MANASIKA*: Atichinta* (excess anxiety), *Atishoka* (excess grief), *Atikrodha*(excess anger), *Atibhaya*(fear).

OTHERS: *Dhatunam Sankshayat, Rogatikarshanat* (weakness due to prolonged diseases*), Marmaghata* (trauma to vital parts)[8]

According to one quotation of *Sushruta* "*Sankshepta Kriya Yogo Nidaan Parivarjnam"* i.e. treatment in short is to avoid the causative factors.[9] If the *hetus* are known, the way of treatment become easy. With knowledge of *nidan* causing disease, one should avoid unhealthy *Ahara* & *Vihara* and adopt suitable *Ahara & Vihara (Upashaya)* to prevent and to control *Sandhigata vata.*

PRIMARY OBJECTIVE

To study the association of *ruksha ahara vihara* as a Causative factor *(hetu)* in patients of *janu sandhigata vata.*

Materials and Method –

This case control study was conducted in Shri Ayurved Mahavidyalaya,Nagpur. The study conducted on known case of *sandhigata vata* and healthy individyla with no symptoms of *sandigata vata*, in a period of 12 months after taking ethical clearance and informed consent of the patients.

SAMPLE SIZE:

Sample size is calculated by Open Epi, Version 3, open source calculator−SSCC
Sample size is determined by pilot study of 10 subjects, which was divided into case and control group. Following assumptions are made on the basis of study –

1. Odd's ratio detected is 2.66 (calculated with the help of pilot study of 10 subject.)
2.Confidence interval (1 – alpha)=95%
3.Power (1-beta) =90%
4.Ratio of cases and control=1
Required sample size
N=70 in each group
Therefore 70 cases and 70 controls were included in study.

a) INCLUSION CRITERIA

- Patients of age group 35 to 55 years.
- Known case of *sandhigata vata* .
  - **For cases-** Patient with known case of *sandhigata vata.*
  - **For control-** Healthy individual with no symptom of *sandhigata vata* and age +/- 5 yrs. with compare to the age of cases.

b) EXCLUSION CRITERIA:

1. Patient suffering from fracture or dislocation/displacement of knee joint.
2. Patient suffering with knee joint TB or Tumour.
3. Patient suffering from secondary OA.
4. Patient having knee joint pain caused due to trauma.

WITHDRAWAL CRTIERIA:

1.The one who firstly agreed for study but further declined to give any information.
2.Who are not willing to communicate or giving any information.

MATCHING CRITERIA :

Matched on the basis of +/- 5 years Age, gender

Assessment criteria.

Assessment was done by following method where exposure was considered when the mentioned below factors like Bread, Biscuit, Toast, *Jowara ,Bajra, ratrijagran* and *atishram* were taken daily ore more than 3 days in week since three years or more than it.

Exposed to *ruksha hetu sevan*	**Frequency**		**Duration**	
	Yes	**No**	**Yes**	**No**
	Daily/3-4 times in week	**In 15 day/occasionally/none**	**≥3years**	**<3years**
1.Bread /toast /biscuits				

2. *Jowar roti or bajra roti*				
3. *Ratrijagran*				
4. *Ati shram* Indulgence in any kind of household physical activity more than 6 hours or jogging/ walking more than 2miles or weight lifting more than 25 kgs or games/ running/cycling more than 2 hours.				

SAMPLE TECHNIQUE:

Simple Random sampling method – for cases Random sample of 70 patient having *sandhigata vata* are selected from concern institute.

Purposive sampling method– for control A purposive sample of 70 healthy individual age matched (±5 years), gender matched and occupation.

METHODS OF DATA COLLECTION RELEVANT TO OBJECTIVE:

1] Primarily consent was taken in their Vernacular language/ English.

2] Known cases of *sandhigata vata* was taken.

3] Detailed history was taken from both groups cases and control to estimate *hetu*.

4] Data was collected on the basis of result.

STATISTICAL ANALYSIS:

Collected data from cases and controls was analyzed statistically by,

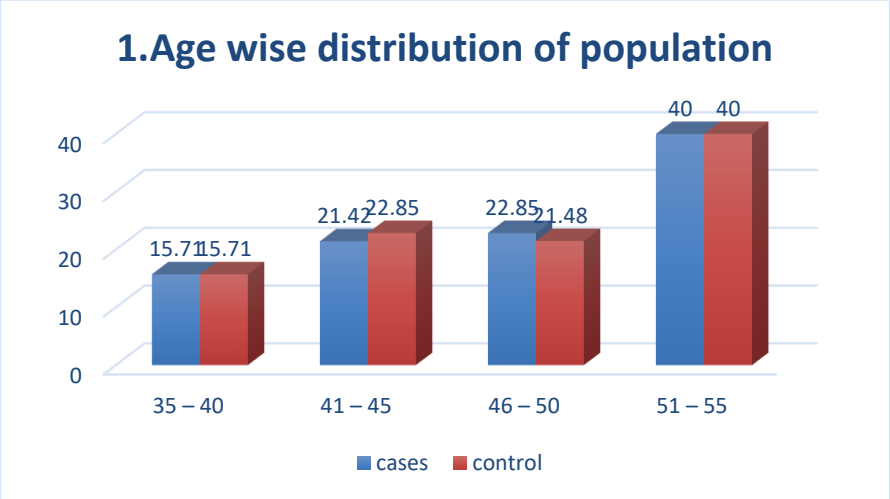
- Descriptive statistics will be calculated to summarize quantitative variables with mean, standard deviation and quantitative variables with frequency and percentage.
- Chi square test of association was used for qualitative factors and two independent samples t-test was used for quantitative factors.
- Association between *sandhigata vata* with exposure factors was assessed with Pearson's Chi-square test. Strength and direction of association was expressed in terms of Odds Ratio (OR) and 95% Confidence Interval (CI).
- P-value less than 0.05 was considered statistically significant for all the comparisons.

Observation and result

Age distribution of study population.

Age in years	Cases		Control	
	N	%	N	%
35 – 40	11	15.71	11	15.71
41 – 45	15	21.42	16	22.85
46 – 50	16	22.85	15	21.48
51 – 55	28	40	28	40
Total	70	100	70	100
Mean Age SD (Range)	47.67 6.77 (45 to 55)		47.61 6.74 (45 to 55)	

P=0.9602,NS



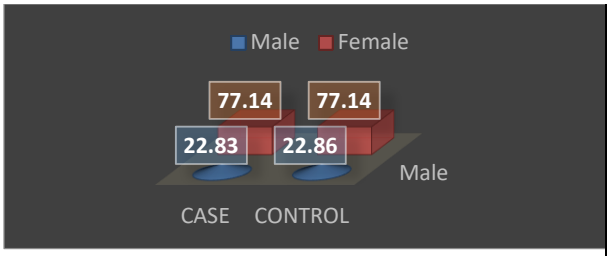
Cases (KNOWN CASE OF SANDHIGATA *VATA*) - Out of 70 Cases, maximum cases were seen in 51-55 age group i.e. 40 % which comprises 28 . whereas minimum cases are seen in 35-40 age group i.e. 15.71 case which comprises 11 cases .

Controls (HEALTHY SUBJECT) – Out of 70 controls , maximum controls are were seen in 51-55 age group i.e. 40 % which comprises 28 . whereas minimum controls were seen in 35-40 age group i.e. 15.71 consist of which comprises 11 control. **Overall**- Mean of age distribution of study subjects among cases is seen 47.67 (± 6.77) & among controls is 47.67 (± 6.77), not significant difference is been observed.

Sex wise distribution of study population.

Sex	Cases		Control	
	N	Percentage	N	Percentage
Male	16	22.83	16	22.86
Female	54	77.14	54	77.14

P=1.000, NS



In case group, 54(77.14%) patients were female and remaining was male. In control group 54(77.14%) patients were female and remaining was male. Comparison of both groups was not significant.

Occupation wise distribution of study population.

Occupation	Cases		Control	
	N	%	N	%
Housewife	22	31.42	14	20
Household worker	30	42.85	14	20
Business	4	5.71	16	22.86
Service	6	8.57	19	27.14
labourer	8	11.45	7	10

P=0.00176, Significant.

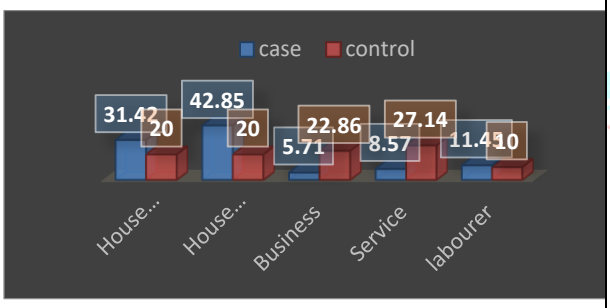


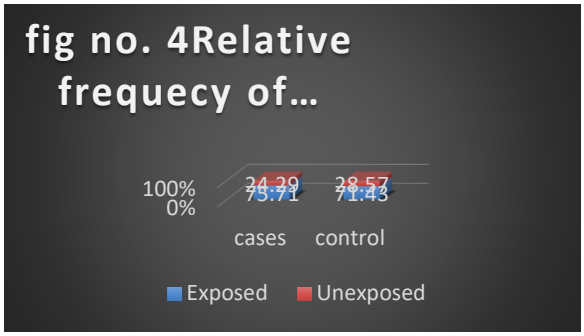
Fig .3 Occupation wise distribution of study population.

The maximum cases were household worker that is 42.85% followed by housewife 31.42 followed by laborer 11.45%

The p value that is 0.00176 was less than 0.05, There is significant difference between the two group.

Table No.4 Relative frequecy of consuming bread , biscuit and toast in case and control groups .

Biscuit /bread or Toast	Number	Cases	%	Control	%	P value
Exposed	103	53	75.71	50	71.43	OR=1.24 95% C.I.(0.55 - 2.84) Chi2=0.3306 P=0.5653,NS
Unexposed	37	17	24.29	20	28.57	
Total	140	70	100	70	100	



Out of 70, 53 cases that is 75.71% and 50 controls that is 71.43 % were consuming biscuits /bread or toast on a daily basis . Maximum no. cases as well as controls are consuming above mentioned factors.

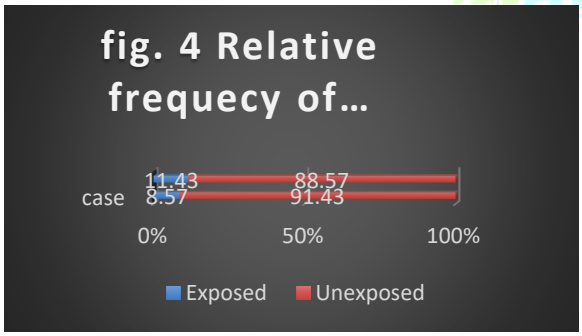
The odds ratio was OR=1.24 , 95% C.I.(0.55 – 2.84) it did not show strength in association.

The p value that is 0.5653 was more than 0.05, There is no significant difference between the two group .

Hence ,it did not shows a association of consuming biscuits /bread or toast *roti* as a hetu in patients of *sandhigata vata* .

Table No. 5 Relative frequency *of bajra or jowar roti in* case and control groups.

Bajra /jowar roti	**Number**	**Cases**	**%**	**Control**	**%**	**p- value**
Exposed	14	6	8.57	8	11.43	OR=0.72 95% C.I.(0.20 – 2.55) Chi2=0.3175 P=0.5731,NS
Unexposed	126	64	91.43	62	88.57	
Total	140	70	100	70	100	



Out of 70 cases, 6 cases that is 8.5% and from 70 controls, 8 controls that is 11.47% were consuming *bajri roti* , .

maximum no. cases well as controls did not take *bajri or jowar roti* in their diet on a regular basis.

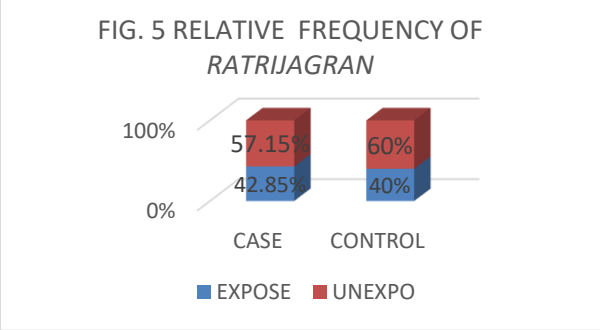
The odds ratio was OR=0.72 95% C.I.(0.20 – 2.55) it did not show strength in association.

The p value that is 0.573 was more than 0.05, There is no significant difference between the two group .

Hence ,it did not shows a association of consuming *jowar or bajra roti* as a hetu in patients of *sandhigata vata*

Table No.5 Relative frequency of of *ratri jagran* in case and control group

Ratri jagran	**Number**	**Cases**	**Percentage %**	**Control**	**Percentage %**	**P value**
Exposed	58	30	42.85%	28	40%	OR=1.071 95% C.I.(0.61 – 2.59) Chi2=0.116 P=0.4961,NS
Unexposed	82	40	57.15%	42	60%	
Total	140	70	100	70	100	



Out of 70 cases, 30 cases that is 42.85% and from 70 controls, 28controls that is 40% were exposed to ratrijagran ,

The odds ratio is 1.26 and 95% C.I.(0.61 – 2.59) which was not a strong association.

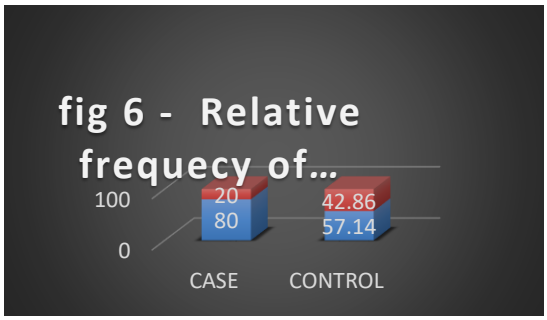
The p value was more than 0.05,

There is no significant difference between the two groups.

Hence ,it did not shows association of *Ratrijagran* as *hetu* in patients *of sandhigata vata* .

Table No. 6 - Relative frequecy of *Atishram* in case and control groups

Atishram	%	**Cases**	**%**	**Control**	**percentage**	**P value**
Exposed	96	56	80.00	40	57.14	OR=3.0 95% C.I.(1.33 – 6.90) Chi2=8.4848 P=0.0036,HS
Unexposed	44	14	20.00	30	42.86	
Total	140	70	100	70	100	



Out of 70 cases , 56 cases that is 80% were exposed to *Atishram hetu* and from control group there were 40 cases that is 57.14% exposed to *Atishram, maximum exposure of hetu* was seen in case group. Comparison of both groups was higly significant.

- As value of p is less than 0.05, **significant difference was observed** between (Cases) and (Controls) study groups in accordance with association of *Atishram Hetu* .
- **Odds Ratio is greater than 1 (i.e. 3). It suggests strength of association**.

Discussion and conclusion

Maximum cases were found in age group 50-55yrs & least found in 35-40 age group,

- Maximum cases were female indicating females more prone to have *sandhigata vata.*
- Occupation like House hold worker and labour shows significant difference.
- Biscuit /bread or toast shows no association as *hetu* in *sandhigata vata*. As Indian diet is a mixed type of diet ,

Maximum cases have mixed type of diet .

- *Jowara /bajra roti* shows no association *as hetu* in *sandhigata vata* as case and control groups had very minimum exposure to this *hetu.*
- *Ratrijagran* do not show association as *hetu*, as maximum cases are female and they do not *ratrijagran.*
- *Atishram* shows a strong association as *hetu* in *sandhigata vata* as maximum no. of cases were exposed to this *hetu* as compare to controls
- Among all the *ruksha aharas* mentioned in the text , only few *ruksha ahara* was taken in this study ,Their may be possibilities the other ruksha factors which are not in the assement criteria are *causing vata prakopa* and leading to *sandhigata vata* disorder. *Atishram* has shown a strong assoaciation with *Sandhigata vata* hence this *vihara* should be avoided that is *nidaan parivarjan*
- Moreover the Aharaj factor consuming biscuit /bread or toast, *jowra /bajra* roti comes under the category *of viprikustha hetu* that if taken for a long period can cause *rukshata* and *vata prakopa*.
- However the Present sample is very small and other *Ruksha hetus* should also be taken which has been not taken in this study .
- Futher study may be required in large scale to ascertain the causative factor.

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