**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. The Human beings are falling prey to various life style disorders, in which the 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 among such disorder is *Sandhigata vata*. As this disease is chronic in nature, food, lifestyle and medicine have influence on relieving and aggravating the symptoms of *Sandhigata vata. 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 *Ayurvedic chikitsa hetu* has so much importance,If the *hetus* are known, the way of treatment become easy*.* In classical *Ayurvedic* texts no specific *Nidana* has been explained for *Sandhigata vata.* Therefore, general *hetu* of *Vatavyadhi* can be considered. Among such *hetus ,ruksha ahara vihara* is also a *hetu* for aggravation of vata .The study is an attempt to find association of *ruksha ahara vihara* as the *hetus of sandhigata vata* which are not directly mentioned in *samhitas*. On the basis of case control study, an attempt is made to find out some *hetus* of *sandhigata vata .*

**Keywords –** *hetu , sandhigatavata ,Nidana*

**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

**Assesment criteria.**

Assesment 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 analysed 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=1.2495% C.I.(0.55 -2.84)Chi2=0.3306P=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 wasOR=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=0.7295% C.I.(0.20 – 2.55)Chi2=0.3175P=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=1.07195% C.I.(0.61 – 2.59)Chi2=0.116P=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=3.095% C.I.(1.33 – 6.90)Chi2=8.4848P=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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