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A study of Radiological changes in *Janu Sandhi* in *Amavata*

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ABSTRACT

Aim - To study radiological changes in *Janu Sandhi* due to *Amavata*. **Objectives** - 1) To study about *Janu Sandhi* and Knee Joint, 2) To study about *Amavata* and Rheumatoid Arthritis. **Observation** - The 7 diagnostic criteria according to American College of Rheumatology, epidemiology and genetics, radiological evaluation is one of them, for knee joint - soft tissue swelling, periarticular osteoporosis, joint space reduction, osteophytes, dislocation of joints, secondary eburnation, pseudocystes, periosteal new bone formation, bone erosion is seen. In radiological changes, soft tissue swelling, joint space reduction and osteophytes is found in 80% patients, periarticular osteoporosis is found in almost 90% patient. **Conclusion** - Female are more prone to radiological changes in knee joint affected by *Amavata* than male. Also age group of 41-50 yrs are more affected and *Vata-Kapha Dehaj Prakruti* people has more radiological changes. This is helpful to find out the extent of progression of disease in stages of disease and treatment of disease.

Key words: *Janu Sandhi, Amavata, Knee Joint, Rheumatoid Arthritis, Radiological changes.*

INTRODUCTION

In the Science of medicine detailed knowledge of the body, its parts and entities is important for well being of human being, so the knowledge of *Sharira* is admirable. *Acharya Sushruta* has described *Sandhi* (Joint) in *Sharir Sthan* in "*Sharirsankhya Vyakaranam Shariram Adhyay*", mentioning 210 *Sandhis* in human body. The place where two body parts join with the help of *Shleshma* is called as *Sandhi* (Joint).^[1]

Acharya Sushruta has defined the term *Sandhi* as a point where any similar type of two structures meet

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each other like, *Asthisandhi* (Bony Joint), *Sira Sandhi* (Venous Joint) or *Peshi Sandhi* (Muscular Joint).^[2] Dealing with *Asthi Sandhi*, are of two types - *Cheshtawant Sandhi, Sthir Sandhi*. Also, there is division of *Sandhi's* into 8 types,^[3] *Janu Sandhi* (Knee Joint) comes under *Kora Sandhi*. The Knee joint is the largest, more complex and weight bearing joint of the body. Many diseases are found in *Janu Sandhi*. "*Amavata*" is one of them. In the developing and mechanical world the lifestyle is too much busy and speedy. Change in *Ahar, Vihar, Dincharya, Ritucharya* results in *Rasa-Raktadi Srotodushti, Dhatodushti, immunocompression* etc. So human being is more susceptible to diseases. *Amavata* is one of the diseases which occurs more often now a days due to above said factors.

It is only in *Madhava Nidan* the disease "*Amavata*" was described first as an independent disease. It is a disease included in *Madhyam Rogamarga*, as it affects *Sandhis*. Though *Ama* and *Vata* are the predominant pathogenic factors but the disease represents *tridoshic* vitiation. It was observed that most of the signs and symptoms of "*Amavata*" as

described in *Madhava Nidan* are quite similar to that of "Rheumatoid Arthritis". According to *Acharya Madhvakara*, the disease is mostly found in *Hasta Pada Sandhi*, *Shiro Sandhi*, *Gulpha Sandhi*, *Trika Sandhi*, *Janu Sandhi*, *Janu Sandhi* and *Uru Sandhi*. There is *Saruja Shotha* over these *Sandhis*. The symptoms seen in *Amavata* are *Angamarda*, *Aruchi*, *Trushna*, *Aalasya*, *Gaurava*, *Jwara*, *Apaka*, and *Angashoonata*.^[4]

In Rheumatoid Arthritis also M.C.P. (Metacarpophalangeal) joints, P.I.P (Proximal Inter Phalangeal) joints, wrist joints, elbow joints, knee joints, ankle joints and M.T.P. (Metatarso-Phalangeal) joints are mainly affected. *Janu Sandhi* is also affected. Lot of study has been done so far on most of the joints in *Amavata*. Now a day we find many patients suffering by *Amavata* with involvement of *Janu Sandhi* but its study remains neglected from many aspects. The radiological aspect is the most neglected, as far as involvement of *Janu Sandhi* is concerned. Therefore, with the help of radiological technique (X-ray), the changes are found in *Janu Sandhi* in patient suffering from *Amavata* is presented here.

AIM

To study radiological changes in *Janu Sandhi* due to *Amavata*

OBJECTIVES

1. To study about *Janu Sandhi* and Knee Joint.
2. To study about *Amavata* and Rheumatoid Arthritis.

MATERIAL AND METHODS

Materials - All Ayurvedic and contemporary references about *Janu Sandhi* (Knee Joint), *Amavata* (Rheumatoid Arthritis) are collected from respective texts.

Methods - Radiological investigation i.e. X-rays of patients suffering from *Amavata* (RA) of *Janu Sandhi* were observed.

Prospective of Janu Sandhi and Knee Joint

Janu Sandhi

Acharya Charak has described that one bone covers the *Janu* anteriorly. This bone is called as "*Janukapalika*".^[5] *Acharya Vagbhata* has described *Janu* in *Kapalasthi*,^[6] which is considered as Patella in modern science. *Acharya Dalhan* has considered two *Sandhi* in a *Janu* region by describing *Janupari* and *Janwadha Sandhi* (*Janunoadha Sandhi*), this is considered as the Proximal Tibiofibular Joint. Hence, *Janu Sandhi* is the main *Sandhi* in the *Janu* region and it is the articulation between the *Urwasthi* (Femur) and *Janghasthi* (Tibia). Two *Janvasthi* are described in *Charaka Samhita*^[7] and *Kashyap Samhita*^[8] as well.

Knee Joint

The Knee joint is the largest and more complex joint of the body. The complexity is due to fusion of three joint in one formed by fusion of lateral femorotibial, medial femorotibial and femoropatellar joints. It is a compound synovial joint, incorporating two condylar joints between the condyles of the femur and tibia, one saddle joint between the femur and the patella. The knee joint is formed by femur lower end (lateral condyle, medial condyle, intercondylar notch), patella, tibia upper end (medial condyle, lateral condyle, intercondylar area, tibial tuberosity) and fibula. Knee joint is mainly comprises of 11 ligaments and 13 busrae is seen.

Amavata

As the name indicate, the two predominant pathological factors i.e. *Ama* and *Vata*. "*Ama*" is undigested and vitiated *Rasa Dhatu* due to improper functioning of *Agni* in *Amashaya* producing *Sama Dosh*, *Dhatu*, *Mala*.^[9] *Vata* the another major component of *Amavata*, pain and restricted movement of joints are due to *Vata* specially *Vyan* and *Saman Vayu*, which are the cardinal features of the disease. When *Ama* is formed in *Amashaya* it causes *Margavarodha* leading to vitiation of *Vata*, which in turn propel the *Ama* throughout the body via *Rasa Dhatu*, then becomes seated in *Shleshma Sthana* especially in the *Sandhis* leading to *Stabhdhata* of body

and produce various symptoms of *Amavata*. The knee involvement becomes easily detectable on plain X-rays with reduction of the joint space, erosions, osteopenia and deformities setting in.

Rheumatoid Arthritis

Rheumatoid Arthritis is a chronic, immune inflammatory, multisystem disease of unknown cause that affects mainly synovial joints with possibility of extra-articular manifestations. The characteristic feature of RA is persistent inflammatory synovitis, usually involving peripheral joints in a symmetric distribution. Generally, the joint involvement is bilateral, peripheral, symmetrical, characterized by early morning stiffness with a positive rheumatoid factor in approximately 75% of patients. These are involved very commonly in RA and detected easily. Typical discoloration occurs at the base of the foot laterally and is known as crescent sign. The knee involvement becomes easily detectable on plain X-rays with reduction of the joint space, erosions, osteopenia and deformities setting in.

Radiographic Evaluation^{[10],[11]}

The 7 diagnostic criteria according to American College of Rheumatology, radiology was one amongst them. Early in the disease, roentgenograms (X-rays) of the affected joints reveal only evidence of soft tissue swelling and joint effusion. As the disease progresses, abnormalities become more pronounced. Periarticular osteoporosis may become apparent within weeks of onset. This periarticular osteoporosis is believed to be in part due to a combination of synovial hyperaemia and disuse due to pain. Loss of articular cartilage and erosions develop after months of sustained activity. Destruction of articular cartilage by pannus leads to joint space narrowing. Further destruction leads to erosions which occur initially at the joint margins. Extensive erosion may disrupt the joint surfaces.

Soft tissue changes of RA in the knee include chronic intracapsular effusion. The fluid tends to accumulate in the suprapatellar pouch. On lateral view, this may be seen as fullness in the suprapatellar area with displacement of the fat lines away from the femur. In anteroposterior view, a curved radiolucent line lateral

or medial to the distal femoral shaft in the suprapatellar area indicates this condition. Massive distention of the popliteal bursa may be evaluated in some cases. Synovial fluid may leak into surrounding tissues. Osteoporosis develops, because the matrix is reduced in quantity there is necessarily a reduction in calcium content. The hallmark of RA in the knee joint space narrowing of all three compartment: the medial, lateral, and retropatellar (Joint space narrowing - Joint space is a misnomer as it is not a space at all but consists of articular cartilage and synovial fluid. Cartilage is of the same radiodensity as the soft tissues and, therefore, is not visualized as such, only the space between the adjacent articular cortices can be appreciated. This destruction of articular cartilage leads to joint space narrowing).

Erosions develop but less frequent in knee. (Erosions - Erosion is an area of destruction of the articular cortex and the adjacent trabecular bone). The process may progress to destruction of major portions of the articular cortex. Pseudocysts, which occasionally are quite large, may form in later stages. Secondary eburnation of the subarticular cortex may result. Sparse, thin periosteal new bone formation may be seen, particularly at the distal femoral metaphyses. Osteophytes are also developed after the development of secondary osteoarthritis (Osteophytes - Osteophytes are bony spurs, which may be quite large, occurring at the articular margins on both sides of the joint).

OBSERVATION

1. For the fulfillment of the present study, the *Amavata* disease has been studied radiologically with clinical manifestation of *Vrushchika Danshavata Vedana, Sandhishotha, Stabhdhata, Angamarda, Aruchi, Trushna, Alasya, Gaurava, Jwara, Apaka, Angashootha*, these symptoms are similar to that of Rheumatoid arthritis.
2. The 7 diagnostic criteria according to American College of Rheumatology, epidemiology and genetics, radiological evaluation is one of them, for knee joint- soft tissue swelling, periarticular osteoporosis, joint space reduction, osteophytes,

dislocation of joints, secondary eburnation, pseudocytes, periosteal new bone formation, bone erosion is seen.

- It is been observed that 80% of patients affected with *Amavata* is found to be females and especially of 41- 50 years age group. Also the people of *Vata-Kapha Prakruti* are more affected or prone to *Amavata*.
- In radiological changes, soft tissue swelling, joint space reduction and osteophytes is found in 80% patients, periarticular osteoporosis is found in almost 90% patient.

CONCLUSION

In radiological investigation (X-ray) of knee joints affected by *Amavata*, the radiological changes found are- soft tissue swelling, periarticular osteoporosis, joint space reduction, osteophytes, dislocation of joints, secondary eburnation, pseudocytes, periosteal new bone formation, bone erosion. Female are more prone to radiological changes in knee joint affected by *Amavata* than male. Also age group of 41-50 yrs are more affected and *Vata-Kapha Dehaj Prakruti* people has more radiological changes. This is helpful to find out the extent of progression of disease in stages of disease and treatment of disease.

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