ANKYLOSING SPONDYLITIS

Ankylosing spondylitis was previously known as Bechterew's disease, Bechterew syndrome, Marie Strumpell disease. Ankylosing spondylitis is a chronic disease characterized by a progressive inflammatory stiffening of the joints. It primarily affects the spine and sacroiliac joints and secondly the other major joints (hip, knee, shoulder etc.) in the body. Complete fusion results in a complete rigidity of the spine, a condition known as Bamboo spine. It is more common in males (male-female ratio 9:1), the age of onset being 18-30 years.

CAUSES:

The exact cause of this disease is not known but tendency to develop the condition may be genetic. HLA-B 27 genotype is positve in 90% of patients.

PATHOLOGY:

- The sacro-iliac joints are usually the first to get involved followed by the spine from the lumbar region upwards.
- The hip, the knee and the manubrio-sternal joints are also involved frequenly.
- Initially synovitis occurs followed by cartilage destruction and bony erosion. The resultant fibrosis ultimately leads to bony ankylosis.
- Ossification of ligaments of the spine also occurs. After bony fusion the pain may subside leaving spine permanently stiff.

HLA-B27:

-Human leukocyte antigen B 27 (serotype B 2701 – 2724) is a class I surface antigen.
HLA-B 27 is strongly associated with a certain set of auto immune diseases referred as Seronegetive spondyloarthopathies.
-HLA – B 27 is a gene that provides instructions for making protein that sits on the surface of cells and helps our immune system determine which protein it comes in contact with are from your own body and which are foreign and potentially dangerous, such as virus and bacteria.
-There are hundreds of form of the HLA – B gene, designated by numbers.
One of them i.e. HLA – B 27 is strongly associated with the development of ankylosing spondylitis.

SITES OF INVOLVEMENT:

- Sacroiliac joint
- Intervertebral joint
- Costovertebral joints
- Brachial joints
- Coxofemoral joints (hip joint)
- Knee joints
- Ankle joints
- Small joints of hands

SIGNS AND SYMPTOMS:

- Mild to severe back and buttock pain that is often worse in the early morning hours

- The pain usually gets better with activity. Continued inflammation of the ligaments, tendons, joint capsules and joints of the spine.
- Fusion of spine (Ankylose) as the joint and the disc spaces are replaced by bone.
- Leading to less motion in the neck and low back.
- As the spine fuses or stiffens, the neck and low back lose their normal curve
- The mid back curves outward (Kyphosis). This fixed bent forward position can result leading to significant disability.
- Inflammation of the small joints joining the ribs and clavicle to the sternum. This causes less expansion of the chest wall with breathing.
- In 40% of cases, ankylosing spondylitis is associated with an inflammation of the white of the eye (Iridocyclitis) causing eye pain and photo phobia.
- Another symptom is generalized fatigue.
- Less commonly aortitis apical lung fibrosis and ectasia of the sacral nerve root sheaths may occur.
- Lifting of the nails (onycholysis) may occur.

DIAGNOSIS:

- A blood test for HLA-B 27
- X ray; which shows characteristic spinal changes and sacroilitis
- CT scan and MRI of the SI Joint

Question mark posture:

In question mark posture or suppliant posture there is loss of lumbar lordosis, fixed kyphosis, compensatory extension of cervical spine and protuberant abdomen.

Test for measurement of AS:

Schober test:

Patient stands upright. Two marks are made on the patient's back: one at the level of the sacral dimples and other 10 cm above. The patient then bends forward as far as possible (attempts to touch toes with knees extended) and the distance between the two marks is again measured. Normally the over lying skin will stretch to 15 cm. Values less than this can be indicative of reduced lumbar mobility.

Modified schober test:

In this test marks are made 5 cms below and 10 cms above the sacral dimples. The distance between these marks should increase from 15 cms to atleast 21 cms with lumbar flexion. The distance less than 5 cms is abnormal.

Test for sacro-iliac involvement:

- *GENSLEN'S TEST:* The hip and knee of the joint of opposite side are flexed to fix the pelvis, and the hip joint of the side under test is hyperextended over the edge of the table. This will cause rotational strain over sacro-iliac joint and give rise to pain.
- *STRAIGHT LEG TEST:* The patient is asked to lift the leg up with the knee extended. This will cause pain at the affected sacro-iliac joint.

- *PUMP HANDLE TEST:* In supine the examiner flexes hip and knee completely and forces the affected knee across the chest so as to bring it close to the opposite shoulder. This will cause pain on the affected side.

Test for cervical spine involvement:

- *FLE'CH TEST:* The patient stands with his heel and back against the wall and tries to touch the wall with back of his head without raising the chin. The inability to touch the wall suggests cervical spine involvement.

Test for thoracic spine involvement:

- Maximum chest expansion from full expiration to full inspiration is measured. A chest expansion less than 5 cm indicates the involvement of costo-vetebral joints.

TEATMENT: No specific therapy is available. The aim is to control the pain and maintain maximal degree of joint mobility.

Conservative methods: These consist of:

- Drugs-NSAIDs are given for pain relief, Indomethacin is effective in most cases.
- Physiotherapy
- Radiotherapy in some resistant cases.
- Yoga therapy.

Operative methods:

It includes osteotomy for marked deformities of the hip/spine. Three main osteotomy performed are –

1)Smith petersen osteotomy
2)Pedicle subtraction osteotomy
3)Vertebral coloumn resection osteotomy
Occasionally, hip or knee arthroplasty is used if there is severe arthritis of those joints.

PHYSIOTHERAPY MANAGEMENT:

The main aim of treatment is to gain mobility of the whole body and spine.

- **Pain:** The pain and muscular spasm in acute stage is controlled by superficial modalities such as hydrocollator packs or cryotherapy. Deep heat is effective in the chronic stage.
- **Mobility:** The main objective is to maintain the mobility of spinal intervertebral joints by various methods. Mobilisation of the facet joints by Maitland techniques is effective. Pool therapy is effective in pain relief. It also improves the mobility and gives a feeling of fitness as whole body is exercised.
- **Respiration:** Free active exercises with deep breathing maintain the mobility and improves respiratory capacity.
- **Body ergonomics:** Maximum emphasis needs to be given to the static as well as dynamic postural attitudes, e.g. keeping the chin tucked in, repeated prone lying with hyperextension at thoracic spine on forearm support, hip hyperextension in prone and trunk lateral bending with deep breathing. Chest should be held up and forward with the shoulder retracted. Repeated shoulder bracing is very effective and should be done as a daily routine.

- **Improvement of muscle power and endurance:** Muscles which are strong and capable of maintaining contraction will provide necessary force to sustain correct posture. Strengthening exercises should be given to the weaker group of muscles.

The progression of the disease usually stops after 10-15 years leaving a permanent residual deformity. In majority of patients total functional independence returns except the fused spine.

References:

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Joshi and Kotwal. (2000). Essential of Orthopaedic and Applied Physiotherapy. B.I. Churchill Livingstone.