PSYCHIATRIC MORBIDITY AND QUALITY OF LIFE IN INDIVIDUALS WITH RHEUMATOID ARTHRITIS: A CROSS SECTIONAL STUDY

DISSERTATION SUBMITTED FOR

Partial Fulfilment of the Rules and Regulations

DOCTOR OF MEDICINE

BRANCH - XVIII (PSYCHIATRY)

THE TAMIL NADU DR. MGR MEDICAL UNIVERSITY, CHENNAI, TAMIL NADU.

APRIL 2016

CERTIFICATE

This is to certify that the dissertation titled, **"PSYCHIATRIC MORBIDITY AND QUALITY OF LIFE IN INDIVIDUALS WITH RHEUMATOID ARTHRITIS :A CROSS SECTIONAL STUDY"** is the bonafide work of **Dr. JOSE MATHEW**, in part fulfilment of the requirements for M.D. Branch – XVIII (Psychiatry) examination of The Tamil Nadu Dr. M. G. R. Medical University, to be held in April 2016. The period of study was from April 2015 to September 2015

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DECLARATION

I, **Dr. JOSE MATHEW**, solemnly declare that the dissertation titled, **"PSYCHIATRIC MORBIDITY AND QUALITY OF LIFE IN INDIVIDUALS WITH RHEUMATOID ARTHRITIS :A CROSS SECTIONAL STUDY",** is a bonafide work done by me at Govt. Kilpauk Medical College, Chennai, during the period from under the guidance and supervision **of Dr. S. Rajarathinam. M.D, D.P.M** Professor of Psychiatry, Govt. Kilpauk Medical College. The dissertation is submitted to The Tamilnadu Dr. M. G. R. Medical University towards part fulfillment for M.D. Branch XVIII (Psychiatry) examination.

Place: **Dr. JOSE MATHEW**

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INSTITUTIONAL ETHICAL COMMITTEE
GOVT. KILPAUK MEDICAL COLLEGE,
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Protocol ID. No. 5/02 /2015 Meeting held on 26/03/2015
CERTIFICATE OF APPROVAL

The Institutional Ethical Committee of Govt. Kilpauk Medical College, Chennai reviewed and discussed the application for approval "Psychiatric Co-Morbidhy and quality of life in individuals with rheumatoid arthritis: A Cross sectional study" – For Dissertation Purpose" submitted by Dr.Jose Mathew, MD (Psychiatry), Govt. Kilpauk Medical College, Chennai - 10.

The Proposal is APPROVED.

The Institutional Ethical Committee expects to be informed about the progress of the study any Adverse Drug Reaction Occurring in the Course of the study any change in the protocol and patient information /informed consent and asks to be provided a copy of the final report.

31/03/15

CHAIRMAN,
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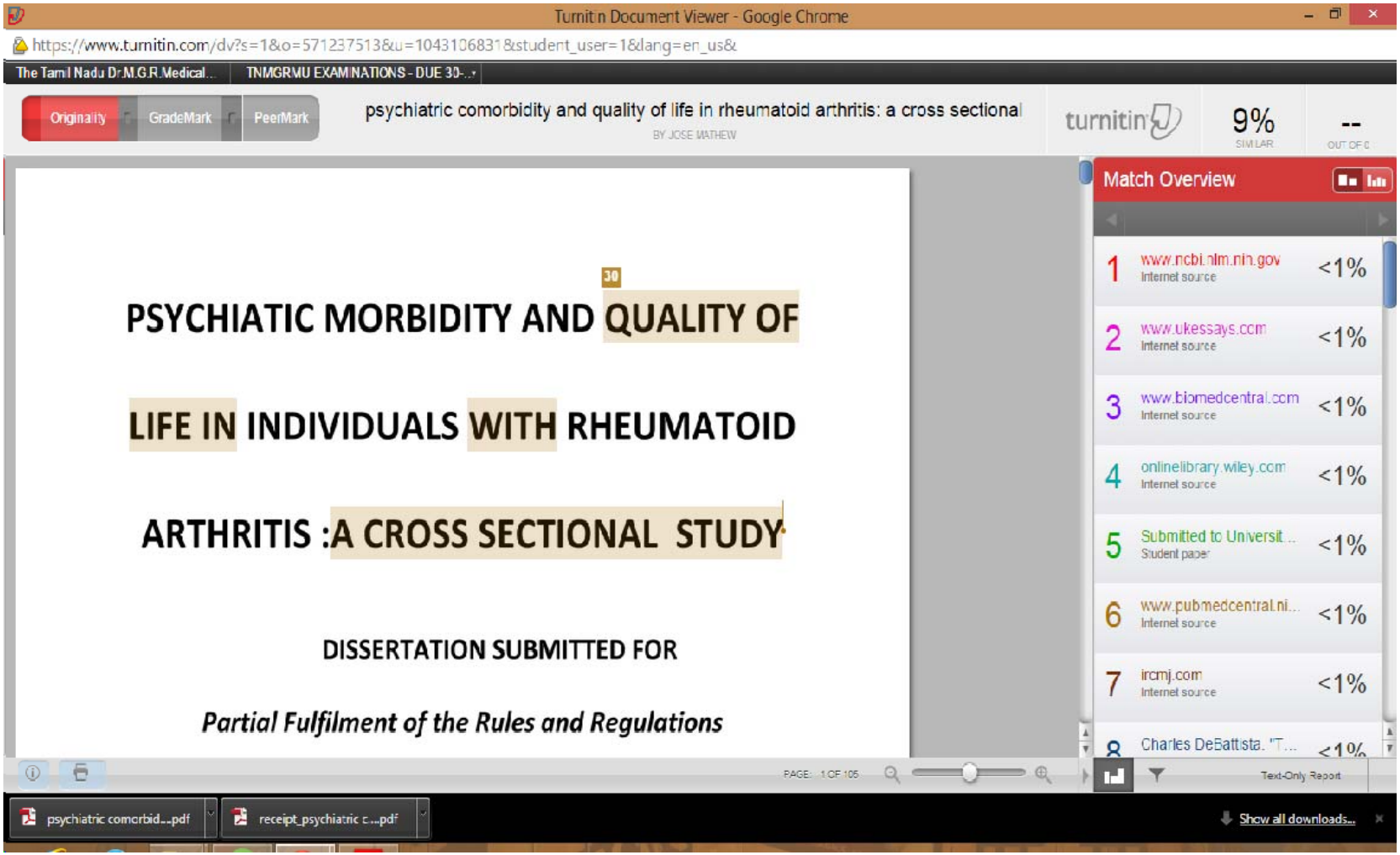
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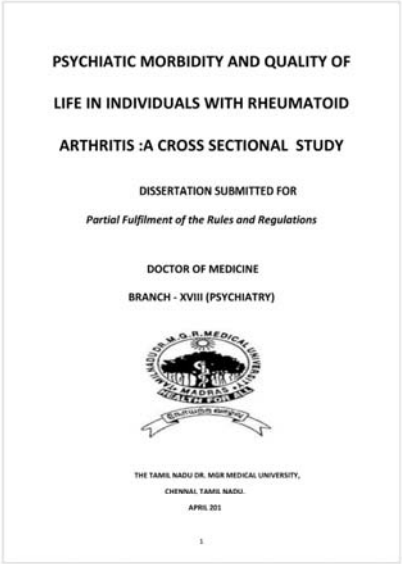

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LIST OF ABBREVIATIONS

R.A	–	Rheumatoid arthritis
Q.O.L	–	Quality of life.
DAS 28	–	Disease activity score in 28 joints
MADRS	–	Montgomery Asberg depression rating scale
HAM – A	–	Hamilton Anxiety rating scale
BPRS	–	Brief psychiatric rating scale
GHQ 12	–	General health questionnaire 12
DMARD	–	Disease modifying antirheumatic agent
SF 36	–	Shortform 36
P.F	–	Physical functioning
R.L.P.H	–	Role limitation due to physical health
R.L.E.P	–	Role limitation due to emotional problem
E/F	–	Energy / Fatigue
S.F	–	Social functioning
G.H	–	General health

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INTRODUCTION

Rheumatoid Arthritis (RA) is a multi-factorial, chronic, inflammatory disease affecting primarily the joints. Pain, fatigue, disability and chronicity are considered as stress factors that may subsequently lead to psychological distress. Longitudinal studies suggest cumulative risk for psychiatric morbidity and intermittent recurrence over time.

Psychological morbidity has impact on higher levels of disease activity, pain, fatigue, work disability, health service use but lower treatment compliance and increased suicide risk and mortality.

Important to know about the prevalence and severity:

1. As it plays a major role in the course of illness
2. Treatment compliance
3. Outcome of the therapeutic management
4. Role of psychiatrist in management.

Hence it is imperative to investigate about the psychiatric morbidity and quality of life as a holistic approach towards the management.

REVIEW OF LITERATURE

Rheumatoid arthritis is regarded as the most common inflammatory arthritis which affects 0.5% to 1 % of the general population around the globe (Wolfe et al-1968, Engel et al-1960-1962, Mikkelsen et al-1967). There are some exceptions for the prevalence rate regardless of the geographic location, race etc as demonstrated by low prevalence in China (0.3%) and very high prevalence in North American Pima Indians (5%). Rheumatoid arthritis has served as the most accessible model for studies in inflammatory and immune modulated disease (Firesten et al, 2002).

Apart from joint manifestation a variety of extra articular manifestations are also demonstrated in Rheumatoid arthritis which signifies that Rheumatoid arthritis is a systemic disease involving multiple organ systems. Extra articular findings can be attributed to the autoantibody production leading to the formation of immune complexes that fix compliment (Weynad et al, 1992). Unique environment provided by the synovium might explain why it is being the primary target of the immune mechanism.

Environment and genetic causes together influence the pathogenesis of Rheumatoid arthritis. It has been long demonstrated that

synovial cell invade and destroy the cartilage, sub-chondral bone, tendons and the ligament which may be irreversible along with major co morbid conditions like cardiovascular diseases(Lee et al, 2007). Hence early detection and treatment is of profound importance.

Role of innate and adaptive immunity

Genes and environmental factors contribute to the pathogenesis. Initially there is repeated activation of innate immunity by various environmental factors, which happens with everyone, but in these individuals who are immune hypereactive, outcome tend to be different. These stimuli in these individuals encode various genes and proteins implicated in Rheumatoid arthritis like class II MHC, PTPN22 and various population specific genes (Rak et al, 2009). Abnormal T cell selection has also been postulated in which auto reactive T cell tend to escape deletion. The environmental stressors can cause citrullination of arginine residues (post transcriptional modification). Individuals with propensity for Rheumatoid arthritis will develop antibodies against these proteins (Rheumatoid Factor) and anticitrullinated protein antibodies (ACPAs). Activation of these synovial innate immunity lead to local inflammatory changes. Presentation of antigen and activation of T and B cell happen, commonly in the central lymphoid organs there by

influencing T and B cell mediated immunity by means of producing various cytokines like Interleukin – 7(Woude et al, 2005).

This mechanism proceeds to a destructive phase mediated by fibroblasts and synoviocytes. Osteoclasts mediate bone erosion. Cartilages get dissolved by the enzymes produced by the synoviocytes.Only way to suppress this destructive process is by therapeutic process.

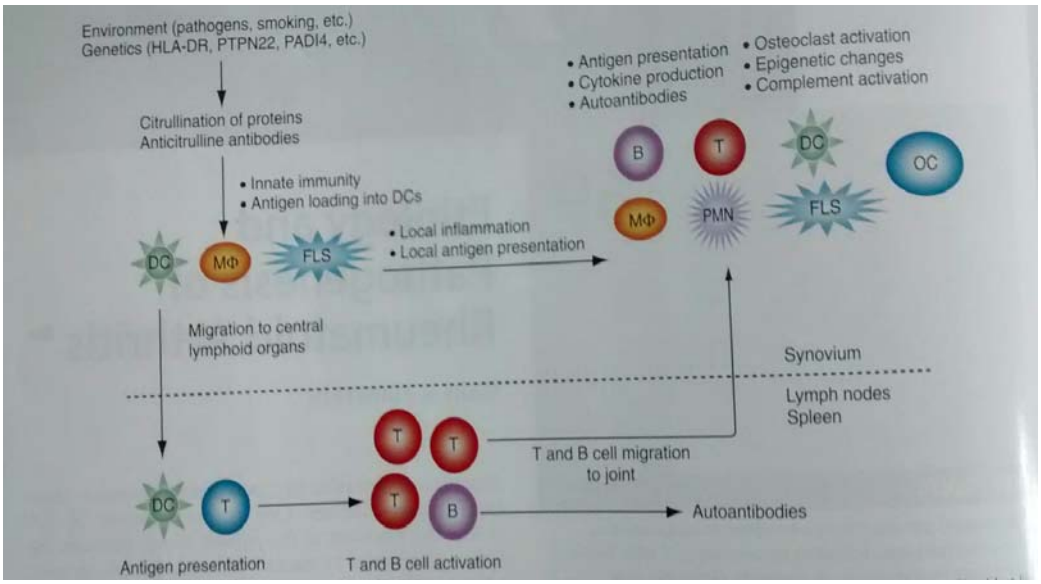


Fig 1: Schematic diagram of disease mechanism in rheumatoid arthritis

Etiology of Rheumatoid arthritis

Genetics evidence has stressed that the concordance rate in monozygotic twins is 12-15 %. The risk for development in fraternal twin of the patient is also high (2 %). Most influential genetic factor studied is

the MHC haplotype of the individual. At least 35 genes have been implicated. A combination of various genes which contribute together for the disease process is gaining importance (Stahl et al, 2010).

Interaction between genes and environment

A variety of environmental factors contribute to development of Rheumatoid arthritis. Smoking has been a proved risk factor. It is believed to trigger off the innate immunity. Repeated activation of the immunity who are genetically predisposed might trigger the initiation of synovitis. Some factors like oral contraceptives have protective effect over Rheumatoid arthritis (RA). The risk of developing RA declines when smoking is stopped (Kallberg et al, 2011). Inhaled particles like silica also increases the risk.Alcohol can act as a protective factor (Haisma et al, 2009).

Gender

Rheumatoid arthritis predominates in women. Ratio ranges from 2:1 to 3: 1 (female: male) (Nelson et al, 2004). Some data postulate that oestrogen modulates the immune function. Nulliparity was suggested as a risk factor, but present studies refute this. During pregnancy, a period of remission is noted, especially in the first and second trimester. Most of the females experience a flare up of disease after delivery. This might be

due to the expression of suppressed cytokines and Alpha fetoproteins (Brennan et al, 2000).

It is a relatively new disease in the western continents and Africa. The first description of RA came in the 17^{TH} century. Garrod distinguished it from Gout and Rheumatic fever in 19^{th} century. Owing to the lifestyle modification and industrialisation the incidence of RA has reduced. Recently the incidence is said to be on the hike which could be better understood by considering the environmental factors responsible.

Many pathogens have been implicated in the pathology of the disease. Mycoplasma is postulated to cause direct synovial infection and they may act as super antigens. Parvo virus and retro virus affects via direct synovial infection. Enteric bacteria, Mycobacterium and Ebstein Barr virus act via molecular mimicry. Bacterial cell wall can cause RA via toll like receptor activation. The probability of a single RA pathogen is unlikely. In a genetically susceptible individual repeated inflammation through receptors that recognise common molecules produced by pathogen might lead to breakdown of tolerance and autoimmune reaction.

Autoimmunity

Aberrant immune responses were recognised following the discovery of Rheumatoid Factor (RF), described by Walen and Rose.

Kunkel et al established RF as an autoantibody. Clinical improvement have been associated with decreased levels of RFs and Anticitrullinated protein antibodies (ACPAs).

Rheumatoid factor (RF)

Identification of RF is the first evidence that suggested autoimmunity might play a role in RA. Presence of RF and its consequences are cardinal factors of RA. It binds to the Fc portion of Ig G. Presence of RF predicts more severe clinical disease and complications than seronegative patients. First degree relatives are also found to be seropositive suggestive of genetic contribution. Difference between RF factors found in healthy individuals and patient is in the paraprotein RFs are derived through re-arrangements and somatic mutations of the germ line genes (Liang et al, 2008).

Anti citrullinated antibodies (ACPAs)

Immunoglobulins that bind to the citrullinated proteins are produced by the patients with RA. They have many prognostic implications. These antibodies bind to the epitopes of filagrin that contain citrulline, derived from the post translational modification of arginine by PAD1 (Nielen et al, 2004).

ACPA are present in the serum of 80-90% of RA patients. They are found to be more specific than RF. The specificity is found to be around 90 %. ACPAs are predictors of more aggressive disease marked by bone and cartilage destruction. Anti citrullinated protein positivity is regarded as an independent risk factor for ischemic heart disease (Liang et al, 2008).

Autoimmune response in RA involves antigens that are expressed beyond the joints. They are glucose 6 phosphoisomerase, heterogenous ribonucleo protein – A2, heavy chain binding protein and heat shock proteins.

The synovium of RA is marked by intimal lining hyperplasia and sub lining infiltration with mononuclear cells. Macrophages in the intimal lining produce various cytokines. Lymphocytes either infiltrate the sub lining or form lymphoid aggregates. Synovial B cell mature and produce antibodies. Mast cells also produce mediators of inflammation. Rheumatoid arthritis effusions mainly contain neutrophil and mononuclear cells. Mediators of inflammation such as prostaglandins and leukotrieneesterases are present in synovial fluid of the patients. Complex intracellular signalling mechanisms regulate cytokine mechanism and action in RA synovium. Reactive oxygen and nitrogen in the joint

contribute to the toxic environment. Abnormality in regulating genes such as p53 tumour suppressor which causes accumulation of cells in the joint. Induction of apoptosis suppresses the inflammation and joint destruction (Nell et al, 2005).

Angiogenesis is the process that provides nutrients to the expanding synovium. There are various angiogenic factors that enhance this process like IL-8, FGF, VEGF.Cartilage and bone degradation are mediated through various mechanisms. Fibroblasts produce several class of protease like metalloproteases, serine proteases, cathepsins etc. Synovial lining cells can themselves invade and damage the cartilage. Bone destruction is mostly mediated by osteoclasts under the influence of various cytokines like RANKL (Kim et al, 2005).

To summarize, both T cell and B cell contribute to the disease process. At various stages various mechanisms are at play. Proper identification and manipulation of these mechanisms and medication might help in effective treatment protocols and better outcome of treatment in patients with RA.

Burden of the disease

It was found that incidence of rheumatoid arthritis increases throughout adulthood with some exception in men. A study conducted in

Olmsted county in the United States, it was shown that incidence increases with age until 85 after which it declined (Linos et al, 1980). In a 10 year extension of this study incidence per 1000000 individuals declined from 62 % to 32.7%, which was prominent in women and the age of incidence shifted to an older age. A recent update showed the incidence in women has increased moderately (Wolfe et al, 1968) which could be attributed to environmental factors. Recent studies have shown that life time risk of RA in individuals is 3.6 % for women and 1.7% in men.

In US, the morbidity and mortality caused by the disease is substantial. Medical care is averaged up to around $5, 919 per year with half of the cost were due to hospitalization (Yelin et al, 1999). In India similar studies are lacking.

Risk factors

Multifactorial predisposition has been attributed to development of RA. It has been shown that relatively few identical twins have RA. Despite the influence of shared epitope on HLA-DRB class, this does not act as a substantial risk factor. It has been thought that gene polymorphism cause a moderately increased risk for the disease (Suzuki et al, 2003). It has been hypothesised that the genetic factor act as a

predisposition and the sub threshold environmental factors act as triggers which trigger the disease onset.

Clinical presentation of early Rheumatoid Arthritis

Insidious onset

Insidious and slow onset happens in around 55-65 % of the individuals (Fleming et al, 2000). Presentation may be with systemic or articular symptoms. Initially may have non specific symptoms and may involve the joints later. Patients often involvement of one joint quickly followed by another. Symmetric involvements of joints are noted.

Morning stiffness is a cardinal sign and it may be due to the accumulation of tissue fluid in tissues in night, which later gets dissipates by getting absorbed into the lymphatics and venules when the joints and muscles are put into use. It is to be noted that, to be specific for joint inflammation, joint stiffness should persist for around 30 -45 minutes. Migratory type of pain seen in Rheumatic fever and palindromic rheumatism is absent here. Early muscular atrophy can also be noted. Hence a weakness out of proportion to the pain is noted. Presence of depression or anxiety adds to the symptoms. Associated weight losses owing to the catabolic function of the cytokines are also noted.

Acute / intermittent onset

In around 8 – 15 % of patients there is an acute onset where pain peaks within few days. The development of pain does not follow a symmetric pattern.

In the intermediate type symptoms develop over days / weeks. It happens in around 15 – 20 % of the patients.

Joint involvement

Most commonly involved joints are the metacarpophalangeal joints and proximal interphalangeal joints (91 %). The metatarsophalangeal joints and wrists are also affected. Smaller joints tend to get affected initially than larger joints. It is shown that joints with highest ratio of synovium to cartilage correlated positively with most frequent involvement in the disease (Mens et al, 1976).

Palindromic pattern

This pattern was described by Hench and Rosenberg in 1992. Here symptoms manifest in a particular joint and periarticular tissues which then later resolves in the reverse sequence. Half of these patients later develop full blown rheumatoid arthritis. Those who do not develop did not show any erosion and does not become chronic (Youssef et al, 1991).

It was shown that use of antimalarials might reduce the risk of progression.

Arthritis robustus

It is more of an unusual reaction of the patient to the disease rather than an unusual presentation (De Haas et al, 1974). It commonly occurs in men characterised by synovitis along with deformity but little pain and disability.

Rheumatoid nodulosis

This is characterised by recurrent pain and swelling in multiple joints, subchondral cysts and subcutaneous rheumatic nodules.

Course and complications

Specific joints

Hands and wrists

There is ulnar deviation of metacarpophalangeal joints (Hastings et al, 1975). Carpal bones rotate due to weakening of extensor carpi ulnaris muscle causing radial deviation. As a result of this, in order to keep a normal line with the radius phalanges adopt an ulnar deviation (Zig zag deformity). Dorsal swelling of the tendon of the extensor carpi ulnaris

and extensor digitorum occurs. Due to the synovial proliferation, pressure develop in the joint spaces leading to the rupture of the ulnar collateral ligament and the ulnar head springs up and can be depressed easily (piano key styloid). Synovial protrusion cyst can be visible on the volar side. Bony ankylosis is seen in joints that have been immobilised by pain or inflammation. A sensitive index for measuring the disease process is the grip strength, which is the tightening of the ligament caused by ligamentous contraction.

Another deformity is swan neck deformity. Here there is flexion of distal interphalangeal joints and metacarpophalangeal joints with hyperextension of proximal interphalangeal joints. There is shortening of the intrinsic muscles which extends tension on the dorsal tendon sheath thereby leading to hyper extension of proximal interphalangeal joints (Gray et al, 1977)

Boutonniere deformity – If the extensor hoods get avulsed the proximal interphalangeal joint may pop up and distal interphalangeal joint may remain in hyper extension.

Most serious result of RA is severe bone resorption. This complication is rare because of advanced treatment.

Three thumb deformities have been explained. They are:

1. Boutonniere like deformity
2. Volar subluxation during adductor hallucis contracture
3. Flexion of metacarpophalangeal joints and hyper extension of distal interphalangeal joints when patients pinch

Tenosynovitis is also a common manifestation. De Quervain tenosynovitis is also not uncommon which can be demonstrated by Finkelstien ‘s test.

Trigger finger – Rheumatoid nodules in the tendon sheath may lock the finger in fixed flexed position which is painful. If chronic it requires surgical correction.

Elbows

Most common manifestation is pain. In severe cases there may be loss of lateral stability. The involvement varies from 20 – 65 %. It is manifested early by loss of full extension, which we fail to notice.

Shoulder

Mainly affects the synovium and distal third of the clavicle. There might be severe pain and can be associated with sleep disorders.

Involvement of the rotator cuff is regarded as the principle cause of morbidity and can be associated with superior subluxation (Enneevaara et al, 1967).Rotator cuff may be damaged by the proliferative synovitis. A unique feature in radiographic examination is dilatation of biceps tendon (Huston et al, 1978). Another manifestation is chronic subacromial bursitis. It is not associated with decreased range of movement or pain. Rare rupture of shoulder joint is also reported.

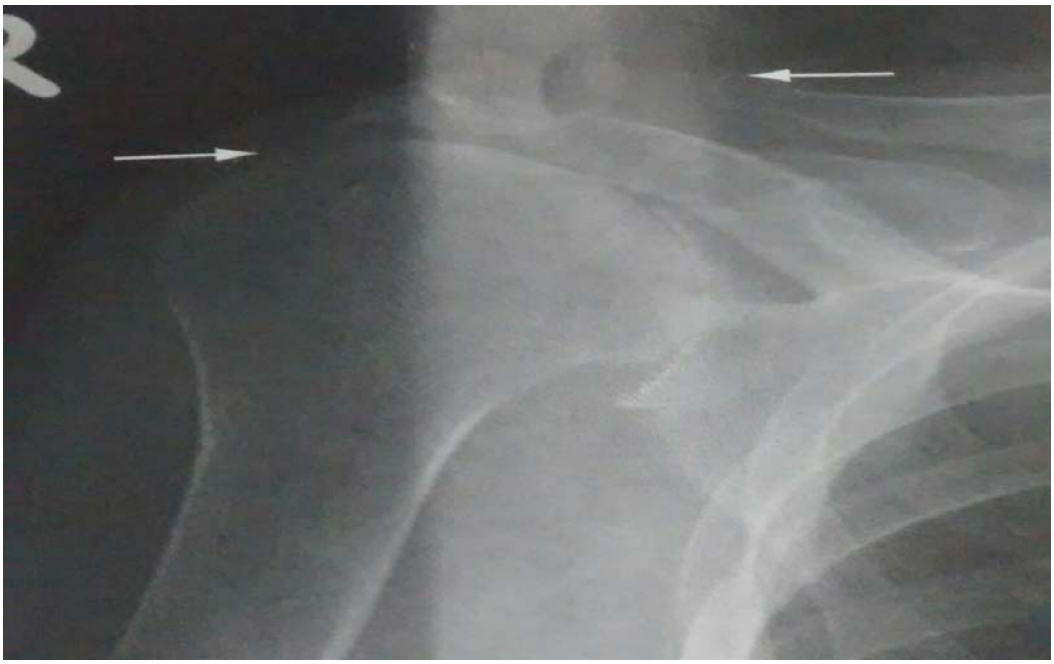


Figure 2: Dilatation of biceps tendon in rheumatoid arthritis

Temperomandibular joint

It is shown that 15 % of the individuals have jaw symptoms in the course of illness. Mostly manifested as an overbite due to the erosion of

mandibular condyle and emenentia articularis. The specific findings are the presence of erosion and cyst on imaging.

Crico aretynoid joints

Hoarseness has been demonstrated in 30 % of rheumatoid patients. The cricoaretynoids might get inflamed, fixed with vocal cords remaining adducted leading to respiratory stridor. The prevalence was found to be 54% on imaging but was clinically not significant (Lawry et al1984). Indirect laryngoscopy has identified functional abnormalities in 32% of the patients.

Sternoclavicular and manubriosternal joint

Few symptoms are reported because of their immobility. Often mild pain has been reported. It most commonly happens when sepsis superimpose.

Cervical spine

In cervical spine there is osteochondral destruction and there is reduced intervertebral distance along with pain. It may be due to the involvement of adjacent neurocentral joint in the inflammation. There may be cervical instability initiated by apophyseal joint destruction causing vertebral malalignment or subluxation.

The atlas can move anteriorly, posteriorly or vertically to the axis. The cardinal symptoms subluxation is pain radiating to the occiput. It can also manifest as slowly progressive spastic quadriparesis with painless sensoryloss and transient episodes of medullary dysfunction. There will be loss of occipito cervical lordosis, resistance to passive spine motion and protrusion of the axial arch can be palpated. Neurological symptoms may not correlate with the degree of subluxation. Peripheral joint erosion occur parallel to cervical spine erosion.

Thoracic, lumbar, sacral spine

Thoracic joints are usually spared in RA.Rare case of synovial cysts of the apophyseal joints are seen manifesting as an epidural mass on the spinal cord causing pain or / and neurological deficits.

Hips

Hip is less commonly involved. Common symptoms when involved are pain in lower buttock or groin. Trochantric bursitis manifests as pain on the lateral aspect of the hip. In RA there is axial migration of the femoral head.

Protrusio acetabuli – The femoral head gets collapsed and reabsorbed and there is remodelling of the acetabulum which gets pushed medially.

There is loss of internal rotation.The femoral head may develop cystic leisions which communicate with joint space.

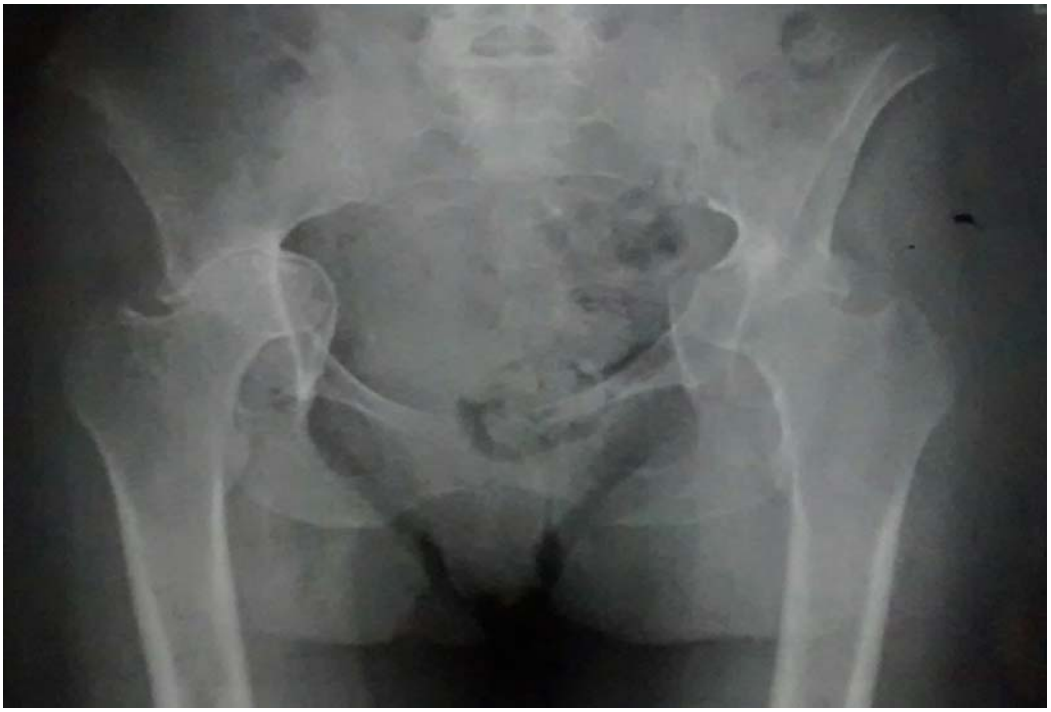


Figure 3: X-ray of hip joint in rheumatoid arthritis

Knee

This is a common involvement in rheumatoid arthritis. Initially there is quadriceps atrophy leading to application of more force than usual through patella. Another functional loss is loss of full extension.

Baker cyst – When a large effusion is present in the knee, flexion causes rise in the intraarticular pressure causing out pouching of the posterior components of the joint. It might also rupture or obstruct the venous flow.

Ankles and feet

Ankle involvement is usually mild. It manifest as cystic swelling anterior and posterior to the malleoli. RA causes damage to the collagenous ligament holding tibia and fibula together and to the talus causing pronation deformity and erosion of the foot. Spontaneous rupture of the Achilles tendon is noted due to the formation of rheumatic nodules and associated diffuse granulomatous inflammation. Pain while walking on uneven grounds can be attributed to involvement of subtalar joints. Together with foot pain, progressive erosion of subtalar joints lead to lateral subluxation which begins in the midfoot and causes rocker bottom deformity.

Metatarsophalngeal joints are commonly affected and mostly during push off in striding. They might be the initial site of inflammation. Cock up toe deformities are produced in proximal interphalangeal joints due to downward subluxation of metatarsal head attributed to involvement of metatarsophalangeal joint. If it progress Hallux valgus and bunion formation occurs. Pressure necrosis is also not uncommon.

Hammer toes – subluxation of metatarsophalangeal joints can cause ulceration of proximal interphalangeal joints which protrude dorsally and result in sensation of “walking on marbles”.

Distal interphalangeal joints are rarely affected.Another entity is tarsal tunnel syndrome in which there is slowing of medial or lateral plantar nerve latency, sometimes both.

Extraarticular manifestations

It varies with the duration and severity of the disease. Most of these complications are a result of immune responses which are evidenced by the presence of RF in the extraarticular tissues. Other protein complexes include antiphospholipid antibodies, circulating immunoglobulins and myoglobins. Involvement of extraarticular tissues are associated with increased morbidity.

Rheumatoid nodules

Rheumatoid nodules consist of a central area of necrosis surrounded by fibroblasts which is in turn surrounded by collagenous capsule with perivascular inflammatory cells. These nodules expand centrifugally and grow in size destroying the connective tissues by protease action. They are commonly found in the pressure points such as olecranon process, proximal ulna and tendons. They are located subcutaneously and the consistency vary from soft to hard attached to the periosteum. Nodules can occur in unusual places like sacral nodes which resembles bedsores, occiput, heart or lungs, sclera, in the central nervous

system (mostly leptomeninges), vertebral bodies causing bone destruction and myelopathy. The development of nodules is mediated by immunological process. Most of the patients test positive for RF if nodules are present.

Rheumatoid nodulosis - It is a condition characterised by multiple nodules in the head, RF positive and episodes of acute synovitis along with cystic leisions of small bones of hand and feet (Ginsberg et al, 1975)

During Methotrexate therapy existing nodules may worsen.They should be differentiated from normal nodules found in healthy children, nodules in rheumatic fever, Gottron papules in dermatomyositis and calcinosis in scleroderma, granuloma annual, nodules due to xanthomatosis, tophi, nodules of multicentric reticulohistiocytosis etc.

Bone density

Rheumatoid arthritis can cause osteopenia and osteoporosis which add to the risk in postmenopausal women. There are high risk for hip fracture and vertebral compression fracture. Minimising steroid use tend to decrease the risk of fracture in postmenopausal women. Fibula is the most common fracture site. There is always risk for stress fracture in thin individuals. Geode formation can weaken bone and can lead to fracture (Maddison et al, 1974).

Muscle

Muscle weakness is a common symptom in rheumatoid arthritis.

Nodular myositis – Focal accumulation of lymphocytes and plasma cells along with degenerated muscle fibres

Various types of muscle abnormalities found are:

1. Atrophy of type II muscle fibres leading to reduced muscle bulk.
2. Peripheral neuromyopathy
3. Steroid myopathy
4. Active myositis
5. Chronic myopathy

Atrophy of type II muscle fibres is the most common abnormality.

Skin

Other than rheumatoid nodules, other manifestations like senile purpura is common.It is the evidence of skin atrophy and capillary fragility common in patients treated with steroids. Other manifestations like palmar erythema and Raynauds syndrome also occur. Vasculitic manifestation like nail fold infarct and pyoderma gangrenosum can occur. Deep dermal vasculopathy manifest as livedo reticularis and is often associated with antiphospholipid antibodies (Fischer et al, 1984).

Eye

Scleritis and episcleritis are common. Keratoconjunctivitis sicca can also occur. Scleritis can progress down to the uveal layer a condition called as scleromalacia perlovans. Rarely perilmbic ischemic ulcers can also occur.

Host and defence infection

Many treatment modalities like steroids and immunosuppressants can lead to incidence of infection. Some are implicated in reactivation of infections like tuberculosis and histoplasmosis. Most common infections are lung infections, skin infection and septic arthritis (Baum et al, 1971) and is associated with increased mortality.

Hemetological abnormalities

Most of the patients have normocytic normochromic anaemia. It can be due to anaemia of chronic disease or may have superimposed folate or vitamin B12 defeciency. Ineffective erythropoesis is a major cause of anaemia in RA (Williams et al, 1982). Thrombocytosis and extra articular manifestation of RA are closely associated (Farr et al, 1983).

Felty's syndrome – This is a combination of severe seropositive RA along with neutropenia and splenomegaly. They are at increased risk of

complication. Presence of large granular lymphocytes is also noted. Paraprotenemia has also been noted and it signifies poor prognosis. There is also high chance of occurrence of myeloma or lymphoma.

Vasculitis

Vasculitic changes involve medium and small blood vessels. Most feared complication is systemic rheumatoid vasculitis which might be due to biological agents used for treatment.

Rheumatoid vasculitis can manifest as

1. Distal arteritis
2. Infectious ulcerations
3. Peripheral neuropathy
4. Palpable purpura
5. Arteritis of viscera

The pathological finding in vasculitis is panarteritis and fibrinoid necrosis. Obliterative endarteritis is a common manifestation (Fisher et al, 1984).

Neurovascular manifestations are also uncommon. It might manifest as mononeuritis multiplex or a mild sensory neuropathy (Conn et al, 1972). Visceral vasculitis is manifested as claudication of the organ

supplied by the vessel. This is associated with poor prognosis. (Geirsson et al, 1987).

Renal disease

Kidney is compromised as a result of the the therapy. Amylodosis is one of the complications. Renal abnormalities can be attributed to salicylates and other NSAIDs. Treatment with gold salts can lead to membranous nephropathy.

Pulmonary disease

Pleural disease

Characteristic pleural pathology are:

1. Pleuritis
2. Exudative pleural effusion
3. Interstitial pneumonitis and fibrosis

Pulmonary fibrosis is associated with increased mortality Principal defect is the involvement of alveolo- capillary gas exchange along with decreased diffusion capacity. There is hypothesis that RA specific autoimmunity is generated in lung due to contact environmental stressors like smoking (Dodson et al, 1966).

Nodular lung disease

Nodules can occur as a single entity which might coalesce. Single nodules appear as coin lesions.

Caplans syndrome – Presence of rheumatoid arthritis and pneumoconiosis produces obliterative granulomatous fibrosis (Caplan et al, 1953). It may in turn lead to the formation of bronchopleural fistula. Risk of malignancy is also present.

Bronchiolitis is also a common extraarticular manifestation of rheumatoid arthritis.

Pulmonary hypertension

It can be detected in more than 30% with rheumatoid arthritis.

Small airway disease

It is characterised by reduced maximal midexpiratory flow rate. It is observed among 50 – 30% of RA patients.

Pulmonary disease due to treatment

Methotrexate and leflunomide can cause pulmonary fibrosis. Treatment with TNF inhibitors can Cause reactivation of tuberculosis.

Cardiovascular system

Increased risk of premature death in rheumatoid arthritis can be attributed to myocardial infarction and congestive heart failure. It has been reported that 70% with nodular RA 40% with non nodular RA have some cardiac involvement (MacDonald et al, 1977).

Atherosclerosis

Prolonged disease duration is associated with increased risk of atherosclerosis. Tobacco smoking act as an augmenting factor along with disease process.

Pericarditis

Pericarditis is present in 50% of RA patients on autopsy. 31% have echocardiographic evidence of pericardial effusion which might be associated with impaired left ventricular function (MacDonald et al, 1977). Cardiac tamponade and constrictive pericarditis are rare complications.

Myocarditis

There might be diffuse infiltration of the myocardium with mononuclear cells and may not be associated with any clinical manifestations.Endocardial inflammation have also been reported.

Conduction defects

Direct granulomatous inflammation can cause AV block. Established erosive nodular disease can cause established heart block. Amylodosis can also cause heart block.

Granulomatous aortitis / Valvular disease

Cases of aortic regurgitation have been reported in patients with rheumatoid arthritis (Iveson et al, 1975).

Diagnosis

Diagnosis is made based on the history and clinical examination, laboratory test and exclusion of other diagnosis.

1987 Revised American Rheumatism Association for Classification of Rheumatoid Arthritis (Arnett FC et al)

1. Morning stiffness
2. Arthritis of >= 3 joint areas
3. Arthritis of hand joints
4. Symmetric arthritis
5. Rheumatoid nodules
6. Serum rheumatoid factor
7. Radiographic changes

These features warrant the diagnosis of rheumatoid arthritis.

2010 ACR / EULAR (European league against Rheumatism) criteria

Joint Involvement	(0-5)
1 Medium to large joint	0
2-10 medium to large joints	1
1-3 small joints	2
4-10 small joints	3
>10 joints	5
Serology	(0-3)
Negative RF and negative ACPA	0
Low positive RF or low positive ACPA	2
High positive RF or high positive ACPA	3
Acute phase reactants	1
Normal CRP and normal ESR	0
Abnormal CRP or abnormal ESR	1
Duration of symptoms	(0-1)
<6 weeks	0
>=6 weeks	1
Cut point for Rheumatoid Arthritis	>=6/10

The above mentioned facts deal concisely with the course and complications a patient with RA goes through. Effective treatment modalities have reduced the morbidity.Disease Activity Score scale is a tool used for measurement of the disease activity in response to treatment.

Psychological distress in patients with rheumatoid arthritis.

Rheumatoid arthritis as been described is a painful and disabling condition which leads to a substantial amount disability without proper intervention. Many patients with rheumatoid arthritis face multiple social and psychological stressors and is often associated with a higher mortality than general population (Dickens et al, 2001; Benitha et al, 2007). Depression can be a usual finding in any chronic disease particularly when it is disabling which has direct effect on patient management.

Mental health is a state of mind where there is enthusiasm, relative absence of depression, anxiety or any other symptoms and there is ability to establish constructive relationship and is able to overcome routine tension and desires (McGlynn et al, 2003). Disease activity has direct correlation mental health and standard of living in individuals with rheumatoid arthritis (Cadena et al, 2003). More than the pain the disease process might affect the psychological well being (Nakajima et al, 2006). It had been already demonstrated that mental health and morbidity affect

the disease activity and duration (Michaud et al, 2012) and is associated with poor compliance (Macnamara et al, 2007).Psychological distress plays an important role in assessment of the disease progress and thereby modifying treatment approach. The patient reported Visual Analogue Score (VAS) in Disease Activity Score in 28 joints (DAS-28) is evidence (Prevoo et al, 1995).

Anxiety and depression are common comorbidities in individuals suffering from Rheumatoid arthritis. The prevalence of depression is assessed to be around 28 – 44% (Isik et al, 2007;Zyrianova et al, 2006;Ang et al, 2005; Keslar et al, 2003). The patients who perceived rheumatoid arthritis to have a serious negative consequence was found to have experiencing high states of anxiety where as those patients who experienced more symptoms of the disease were presenting with depressive symptoms (Graves et al, 2009; Murphy et al, 1988)

It has been documented that most common psychiatric comorbidity associated with rheumatoid arthritis is depression and anxiety. Rheumatoid illness perse leading to a psychotic disorder lacks confirmation.

Depressive disorder in rheumatoid arthritis

In mild, moderate and severe depressive disorders there will be easy fatigability, depressed mood and loss of interest. Other symptoms like reduced concentration and attention, reduced self esteem, guilt, pessimistic thoughts, suicidal thoughts can also co-occur. Duration for a period of two weeks is required for the diagnosis of a depressive disorder irrespective of the severity. The disorder occur episodes with average length of untreated episodes being 6 months (ICD- 10)

By means of interviews and detailed clinical examination conducted the prevalence of depression varies from 13- 40% based on the disease activity and sociodemographics. They have twice the chance of suffering from depression than general population (Creed F et al, 1990; Frank RG et al.,). The psychological distress alters the way the individual perceive the physical illness, thereby increasing the burden. It has been demonstrated that depression can be correlated with pain (Dickens et al, 2001). This correlation was found to be significant (Pearsons r = 0.46) (Callahan et al). The pain pattern explained in relation with depression is more verbal graphic description type like excruciating pain (MacKinnon et al, 2007). There is a relative lack of longitudinal studies which throw light on the relationship between depression and pain in rheumatoid

arthritis (Brown et al, 1989; Hawley eta al, 1988 McFarlane et al, 1988; Wolfe et al, 1993). Other studies with musculoskeletal problems have shown that the condition is bidirectional (Magni et al, 1994). It has been shown that around 10% reduction in ones routine functional ability is associated with seven fold increase in the depressive symptoms (Katz PP et al, 1995).In general medical patients show improvement in depressive symptoms with recovery in functional ability (Von Korff et al, 1992).

It has been suggested that apart from pain and disability multiple factors are at operation which may cause depressive symptoms (Mindhani et al, 1988). Lack of social support plays a significant role (Murphy et al, 1988). Dynamic relationship between depression and psychological distress and immune dysfunction has also been validated (Herbert et al, 1993). There are studies which show that depression increases the disease activity and psychiatric intervention reduces disease activity (Bradley et al, 1987). There is no evidence of relationship between depression and laboratory markers (Pillowsky et al, 1993 Murphy et al, 1988).

These individuals perceive illness as incurable and hopeless even when the actual severity is adjusted for (Murphy H et al, 1999). Depression is also associated with intermittent flaring up of the disease (Herwicz et al, 1993). Depression adversely affect the health seeking

behaviour (Wells et al, 1989; Mcfarlane et al, 1999; Manning et al, 1992).Depressed RA patients have poorer medication compliance (DiMatteo et al, 2000). Parker and Wright had suggested a bio psychosocial approach in view of all these perspectives for the management of RA in 1995. Depression in RA remains underestimated due to misconceptions that treatment is not necessary (Riflein et al, 1992).

Generally SSRIs are the first line drugs although tricyclic antidepressants in low doses are also used (Anderson et al, 2000; Ongheva et al, 1992)

Anxiety in rheumatoid arthritis

There will be persistent or intermittent anxiety in situations associated with apprehension, motor tension, autonomic over reactivity etc. This state can occur co morbid with depression.

The prevalence of anxiety varies in different studies. Some have reported the prevalence to be 44% (Zyrianova et al, 2006) while in another study it is reported to be 13.4% (Isik et al, 2007). A prevalence of 15.9% was detected for mixed anxiety depression (Ishim et al). VanDyke has concluded that if rheumatoid arthritis patients are concomitantly depressed chance of co-occurrence of anxiety is also significant and its relationship with disease duration is not accounted

for(2004). A prospective study conducted by Hawley et al with 400 patients concluded that initial psychological scores were associated with pain levels and repeated hospital visits(1988).

Quality of life in rheumatoid arthritis

Quality of life is a measure of the requirements which are necessary conditions for anyone's happiness (McCall, 1975). Frankl, 1963 defined quality is about perception of 'meaning'. Quality of life assessment is an important factor for person centred clinical care. It is an important outcome measure for clinical research and health service research. It assess the health needs of a population and prioritise research allocation.

Benitha and Filey compared 55 SouthAfricans with RA and Systemic lupus erythamatosis and concluded that both have profound effects as Health Related Quality of Life (HRQOL) and disease activity rather than organ damage or sociodemographic characteristics correlated with quality of life and functional disability (2007). Rheumatoid arthritis was found to be directly related to lower quality of life. Depressive symptoms were directly correlated with quality of life (Cadena et al, 2003).

Michaud et al studied 10, 319 RA patients and found health assessment questionnaire and SF 36 and found that quality of life is associated with mortality risk. It has been described that disability in activities of daily living and depression has profound effect on quality of life in patients with rheumatoid arthritis. It has been suggested that recognising relationship between quality of life and disease variables in RA patients can help to develop further management strategies to improve patients living. It has been identified that early rheumatoid arthritis has broad impact on quality of life (2012). A study by Alshiri et al concluded that in patients with rheumatoid arthritis, disease severity indices are associated with physical quality of life (2011).

AIM & OBJECTIVES

AIM

To assess the prevalence and severity of psychiatric morbidity and quality of life in individuals suffering from Rheumatoid arthritis

OBJECTIVES

1. To assess psychiatric manifestations such as anxiety, depression, psychotic symptoms among patients with rheumatoid arthritis
2. To understand the clinical correlates of the psychiatric manifestations among patients with rheumatoid arthritis.
3. To assess the quality of life among these patients

METHOD AND MATERIALS

A cross sectional design was used in this study

CASES

Fifty six consecutive patients with rheumatoid arthritis attending the outpatient service of Department of Rheumatology in Govt. Kilpauk medical college, Chennai.

INCLUSION CRITERIA

1. Male and female patients attending the outpatient service of Rheumatology department of Kilpauk medical college, Chennai with a definitive diagnosis of rheumatoid arthritis according to 1987 revised ACR criteria for rheumatoid arthritis.

2. Participants between 17 – 60 years of age

3. Duration of illness since the diagnosis is more than one year.

EXCLUSION CRITERIA

1. Acutely ill individuals
2. Presence of any psychiatric disorder prior to the diagnosis of RA
3. Age less than 17 years and more than 60 years.
4. Co-existing Metabolic syndrome like diabetes, hypertension, coronary artery disease, obesity, hypothyroidism etc.
5. Individuals on treatment for steroid psychosis

MATERIALS USED

1. Semi structured sociodemographic proforma to elicit socio economic and other information such as past history, family history, personal history, premorbid personality details, and clinical history.
2. Disease activity score in 28 joints (DAS 28) to measure the severity or the disease activity of rheumatoid arthritis.
3. General health questionnaire 12 was used to screen for any psychological distress in the study population.
4. International classification of diseases 10 (ICD-10) criteria was used to make a definite psychiatric diagnosis.

5. Montgomery Asberg depression rating scale (MADRS)

6. Hamilton anxiety rating scale (HAM-A)

7. Brief psychiatric rating scale (BPRS)

8. Short form 36 (SF – 36)

TYPE OF STUDY

This is a cross sectional study

PERIOD OF STUDY

April 2015 to September 2015

PLACE OF STUDY

Department of Rheumatology
Government Kilpauk medical college and hospital
Chennai – 10

ETHICAL COMMITTEE

The study was approved by the Institutional Ethical Committee, Government Kilpauk Medical College via letter dated 26/3/2015

All subjects gave informed consent for participation in written form. For those who were illiterate, consent form was read to them and they were requested to put their thumb impression, if they consent for participation.

STATISTICAL ANALYSIS

1. Chi square test: This test shows the relationship between two categorical variables. Its value reflects the strength of this relationship

2. For continous variable, t test (2 groups), one way of Analysis variance (ANOVA) (more than two groups) were used.If the values are not following normal distribution, non parametric ANOVA was used.

3. ROC curve was used to study about onset of psychological distress

p value.

The probability that a finding has occurred randomly rather than as a result of a treatment or intervention. A p value $p < 0.05$ is often considered as significant, but the lower this figure, stronger the evidence

SCALES and MEASURES USED IN THE STUDY

1. Disease activity score in 28 joints (DAS 28) score

Disease activity score combines single measurement variables into an overall continuous measure of rheumatoid arthritis activity. It is a statistically useful entity. It is helpful for monitoring the disease activity in clinical practice. DAS 28 is analogous to disease activity score but contains simplified 28 joint counts. It can be converted to actual DAS using a formula. DAS score is easily calculated using a calculator or a computer with an estimated time of one minute.

Interpretation of scores

Low disease activity – DAS < 3.2

Moderate disease activity – 3.2 < DAS > 5.1

High disease activity – DAS > 5.1

Remission - < 2.6

A change of 1.2 in DAS is a significant measure of change.

The European League against Rheumatism (EULAR) response criteria classify patients as good, moderate or non – responders based upon the change in DAS score and the level of DAS reached.

2. General health questionnaire 12 (GHQ 12)

The GHQ 12 is a measure of current mental health. It focuses on two major areas – the inability to carryout normal functions and the appearance of new or distressing experiences. It consists of 12 questions and ask the individual whether he is experiencing the symptoms currently and then they are rated on a four –point scale.

Goldberg et al has defined that a cut off score of 2 or 3 would be significant. A score of 2 or less indicates the absence of a mental disorder and a score of 3 or higher may be the indicator for the presence of a mental disorder. It has been found that a cut off score of 1 or 2 yielded best sensitivity (83.5 %) and specificity (75.1%) for identifying patients with an ICD – 10 or DSM IV diagnosis. It has been found that a cut off score of 3 or 4 is more accurate in identifying older adults with psychological distress.

3. Montgomery Asberg depression rating scale

This rating scale is an interview based questionnaire. It moves from broad questions about symptoms to assessment of severity of symptoms precisely. The symptoms touched upon to measure the severity of depression are:

1. Apparent sadness
2. Reported sadness
3. Inner tension
4. Reduced sleep
5. Reduced appetite
6. Concentration difficulties
7. Lassitude
8. Inability to feel
9. Pessimistic thoughts
10. Suicidal thoughts

Each symptom is graded from 0 to 6

Interpretation of scores

0 to 6 – normal

7 to 19 – mild depression

20 to 34 – moderate depression

More than 34 – severe depression.

4. Hamilton rating scale for anxiety (HAM – A)

This rating scale contains questionnaire used to assess anxiety. It was generated by Max Hamilton in 1959. It remains the widely used and well-validated tool by psychiatrists in measuring anxiety. It is advised to

be administered by an experienced clinician. The time taken to administer is about 10 to 20 minutes, clinician must choose the possible replies to each question by interviewing the patient and by detecting the patient's symptoms. The HAM-A looks into 14 parameters, each item is scored on a 5-point scale, ranging from 0=not present to 4=severe. The Sensitivity is 85.7% and the Specificity is 63.5%.

Interpretation of scores

0-13-normal

14-17 -mild anxiety

18-24-moderate

>25-severe

5. Brief psychiatric rating scale

It is considered to be one of the oldest rating scales to measure psychosis and it was first published in 1962. The Brief Psychiatric Rating Scale (BPRS) contains 24-item symptom scale. The BPRS is used along with clinical interview in which the interviewer makes observations amongst several symptomatic criteria and depends upon patient self-report for other criteria. Items 1 to 14 are rated based upon patients self-report during the interview. Symptoms not assessed are marked as “NA.” Items 7, 12 and 13 are also rated on observed behaviour during the

assessment. Items 15 to 24 are rated based upon the patient's observed behaviour or speech during the clinical interview.

6. Short form – 36

It is a 36 item patient reported scale of health status. It is used in health economics for quality adjusted life year calculation and to determine cost – effectiveness treatment. This is a scale commonly used to measure quality of life in chronic general medical condition. It consists of eight scaled scores which are the sum of questions in each section. The scale is then converted into a 0 – 100 scale. It is regarded that lower the score, higher the disability is and vice – versa. Seven sections in the questionnaire are:

1. Physical functioning
2. Role limitations due to physical health
3. Role limitation due to emotional problem
4. Energy / Fatigue
5. Social functioning
6. Pain
7. General Health

RESULTS AND DISCUSSION

5.1 Descriptive analysis of the patient group

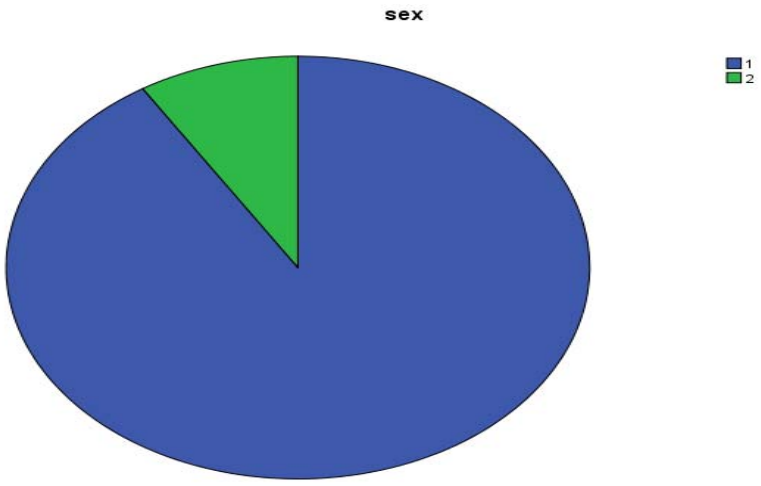
5.1.1 Socio-demographic characteristics of the patients with rheumatoid arthritis

Socio-demographic characteristics of the patients with rheumatoid arthritis

Table:1 sex

	No of patients	Percentage	Valid Percentage	Cumulative Percentage
Female	51	91.1	91.1	91.1
Male	5	8.9	8.9	100.0
Total	56	100.0	100.0	

Figure 1

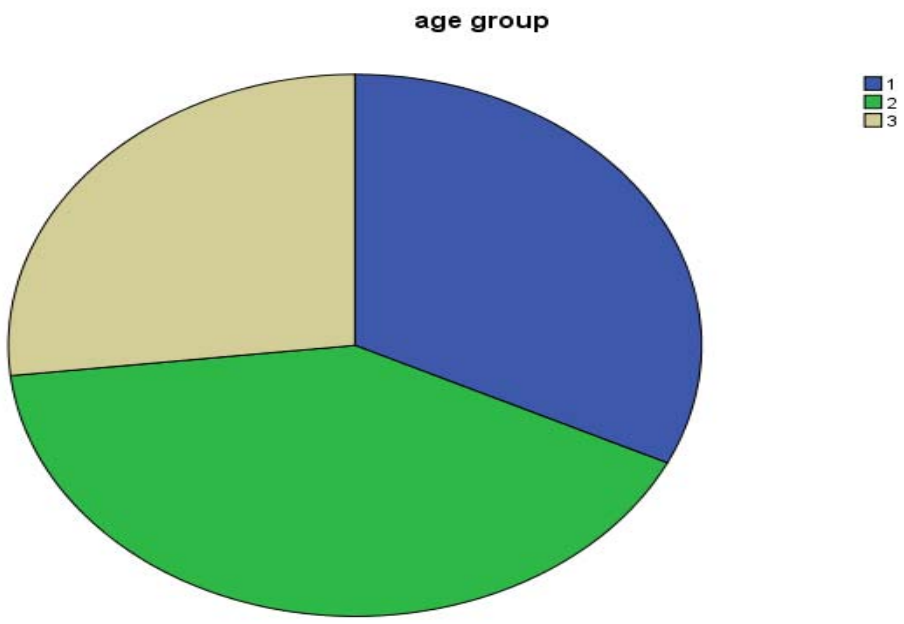


1 : Female, 2 : Male

Table 2: Age group

Age in years	No of patients	Percentage	Valid Percentage	Cumulative Percentage
17-39	18	32.1	32.1	32.1
40-49	23	41.1	41.1	73.2
>50	15	26.8	26.8	100.0
Total	56	100.0	100.0	

Figure 2



1:17-39 years, 2: 40 – 49 years, 3 - >=50 years

Table 3: Marital Status

		No of patients	Percentage	Valid Percentage	Cumulative Percentage
unmarried		1	1.8	1.8	1.8
	Married	44	78.6	78.6	80.4
	Separated	4	7.1	7.1	87.5
	Widow	7	12.5	12.5	100.0

Figure 3 : unmarried, 2 : married, 3: separated, 4 :widow

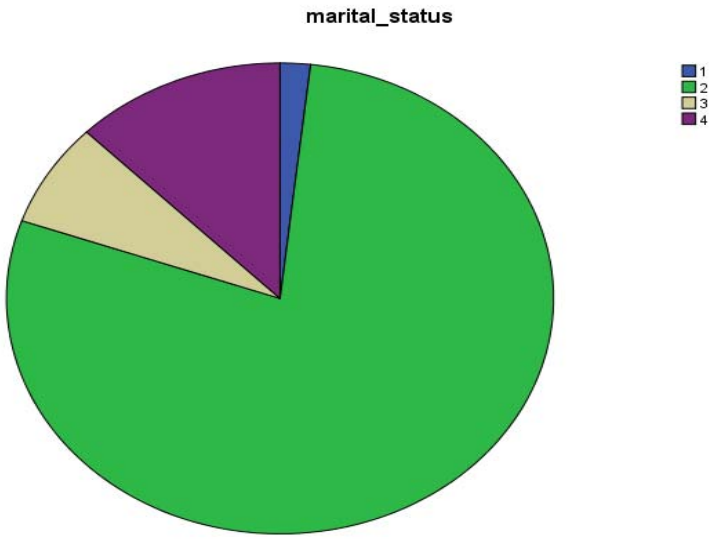
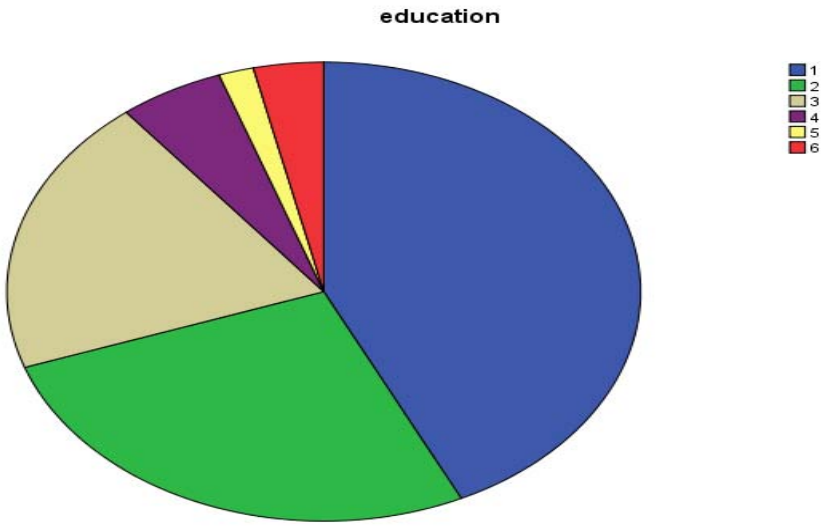


Table 4: education

	No of patients	Percentage	Valid Percentage	Cumulative Percentage
Primary school	24	42.9	42.9	42.9
Middle school	15	26.8	26.8	69.6
High school	11	19.6	19.6	89.3
Higher secondary	3	5.4	5.4	94.6
Graduate	1	1.8	1.8	96.4
Uneducated	2	3.6	3.6	100.0
Total	56	100.0	100.0	

Figure 4

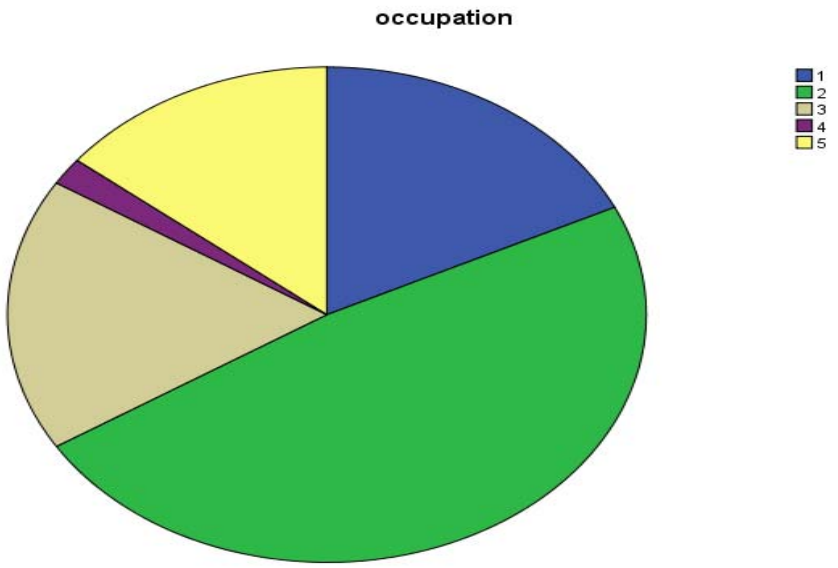


1 – primary school, 2 – middle school, 3 – high school, 4 – higher secondary, 5 – graduate 6 – unducated

Table 5: Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Manual labourer	10	17.9	17.9	17.9
housewife	27	48.2	48.2	66.1
housemaid	10	17.9	17.9	83.9
unemployed	1	1.8	1.8	85.7
others	8	14.3	14.3	100.0
Total	56	100.0	100.0	

Figure 5

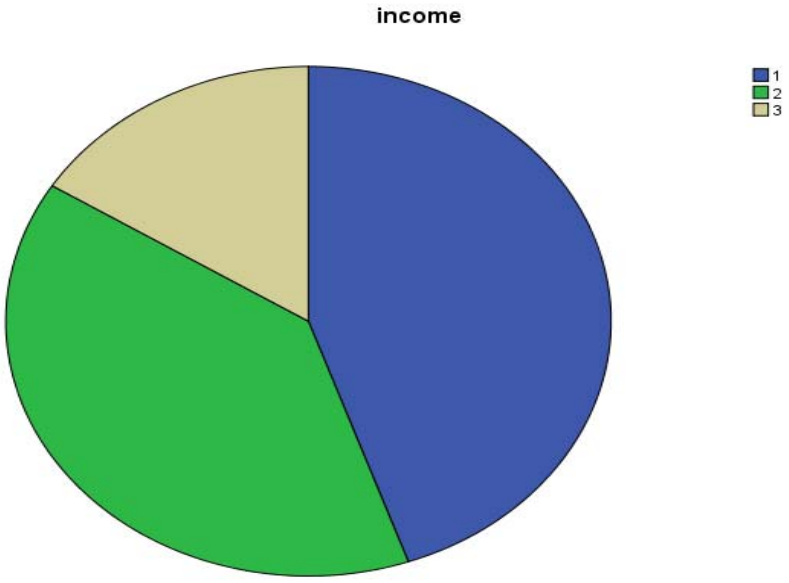


Occupation-manual labourer 1, housewife 2, house maid 3, unemployed 4, others 5

Table 6: Income

	Frequency	Percent	Valid Percent	Cumulative Percent
<5000	25	44.6	44.6	44.6
5000-10000	22	39.3	39.3	83.9
>10000	9	16.1	16.1	100.0
Total	56	100.0	100.0	

Figure 6:<5000 low income 1, 5000-10000 middle income 2, >10000 - high income 3



Among the total sample size, most of them were females (91.1%) and were belonging to 17 – 50 years of age group (73.2%) and were married (78.6%). Most of them were educated upto primary school

(42.9%) and were housewives (48.2%). Most of them were earning less than Rs. 5000/month (44.6%)

5.1.2 Clinical characteristics of the patients with rheumatoid arthritis

Table 7 : Duration in monthhs

					95% Confidence Interval for Mean	
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound
Total	56	38.39	24.715	3.303	31.77	45.01

Duration in months

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	4953.772	3	1651.257	2.998	.039
Within Groups	28641.585	52	550.800		
Total	33595.357	55			

The mean duration of illness was 38.39 months and it was shown to be statistically significant (p = 0.039)

98% of the patients were on corticosteroids and Disease modifying antirheumatic agents.

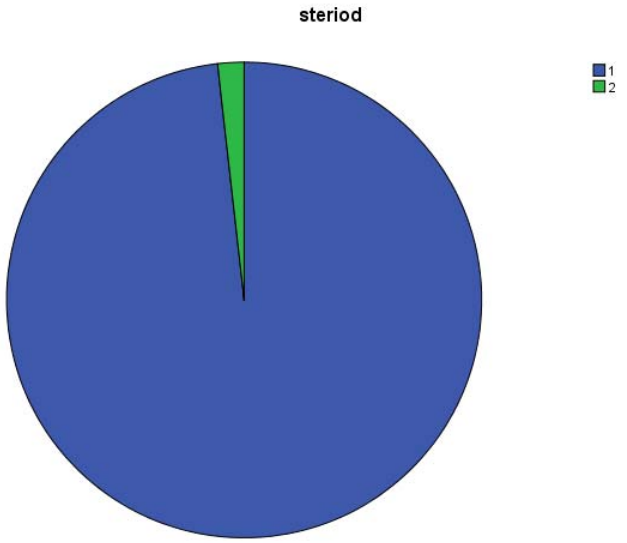


Figure 7: Patients on steroids, 2 : patients not on steroids

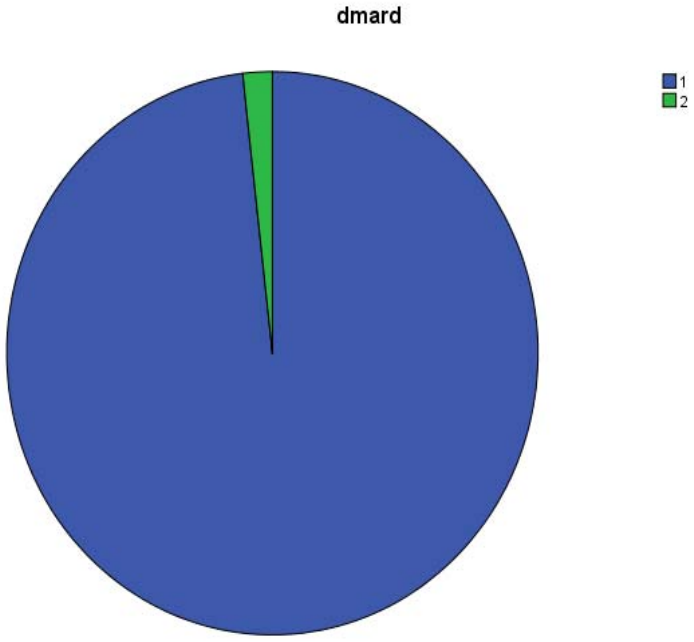


Figure 8- patient on DMARD, 2- patients not on DMARD

Table 8: DAS_28_score

	Frequency	Percent	Valid Percent	Cumulative Percent
Mild (<3.2)	12	21.4	21.4	21.4
Moderate(3.3 -5)	32	57.1	57.1	78.6
Severe(>5.1)	12	21.4	21.4	100.0
Total	56	100.0	100.0	

Most of the patients in the study population were having moderate (57.1 %) rheumatoid arthritis.There was an equal proportion of mild and severe rheumatoid arthritis (21.4%).

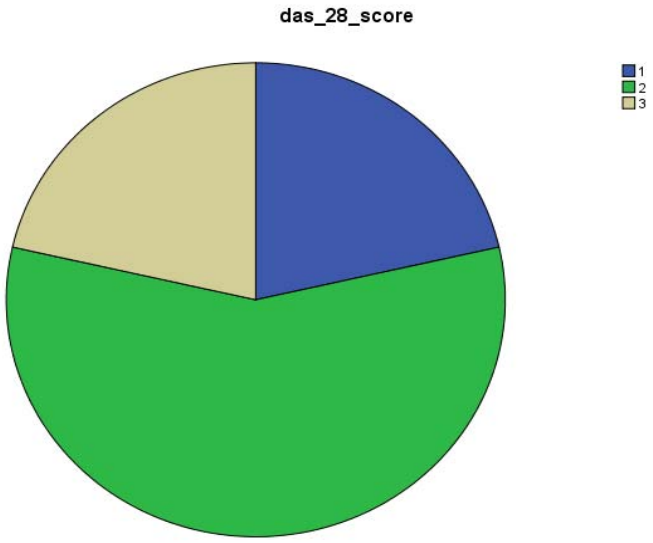


Figure 8: DAS 28 score for disease activity: >5.1 high disease activity1, 3.3-5.0 moderate2, <3.2 low, remission 3

5.1.3 Psychiatric manifestations as elicited by General health questionnaire 12 and clinical interview

50% of the individuals were screened positively with general health questionnaire and was further assessed in detail.

Table 9:Psychiatric diagnosis

	Frequency	Percent	Valid Percent	Cumulative Percent
No diagnosis	35	62.5	62.5	62.5
Depression	13	23.2	23.2	85.7
Anxiety	4	7.1	7.1	92.9
both	4	7.1	7.1	100.0
Total	56	100.0	100.0	

In the study population 23.2 % (n=13) were suffering from depression, 7.1% (n=4) were suffering from anxiety and 7.1 % (n=4) were having both anxiety and depression.A majority of 62.5 % (n =35) did not have any psychiatric diagnosis. No patient had a psychotic illness.

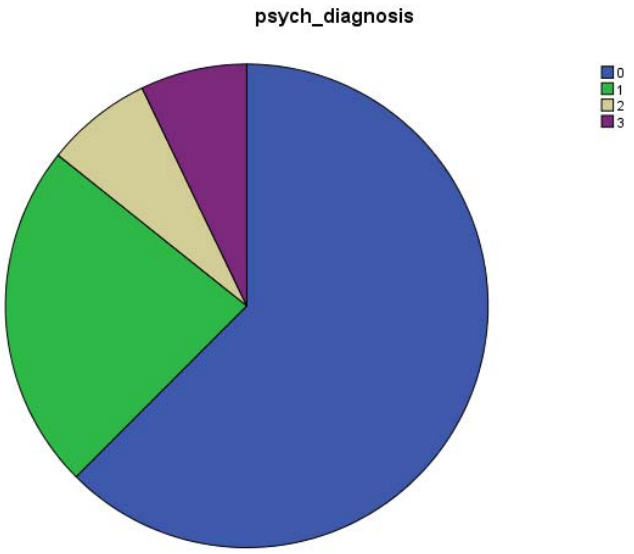


Figure 9: depression 1, anxiety 2, both depression & anxiety 3, no diagnosis 0

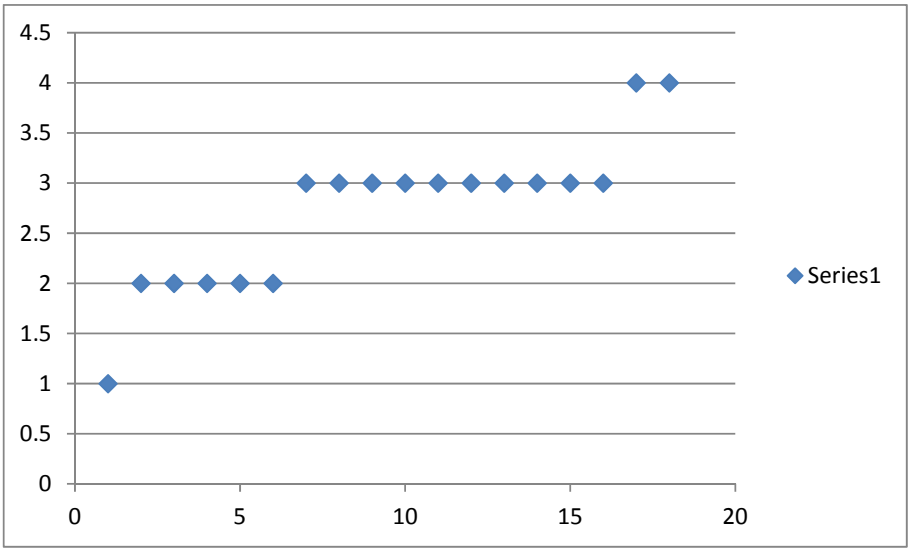


Figure 10 : Prevalence of type of depressive disorder

Among the patients suffering from depression 27.7% (n=5) were suffering from mild depression, 50% were suffering from moderate

depression and 55.5% were suffering from moderate depression and 11.1% (n=2) were suffering from severe depression.

Recurrent depressive disorder was noticed in 22.2% (n=4) and all were having moderate depression currently.

All the individuals with anxiety disorder n= 8 (100%) were having generalised anxiety disorder

It has been noted that none of the individuals had suffered from a manic episode or a psychotic illness ever.

None of the depressive episodes of the study population was associated with psychotic symptoms.

5.1.4 Psychiatric manifestations - anxiety and depression among patients with rheumatoid arthritis

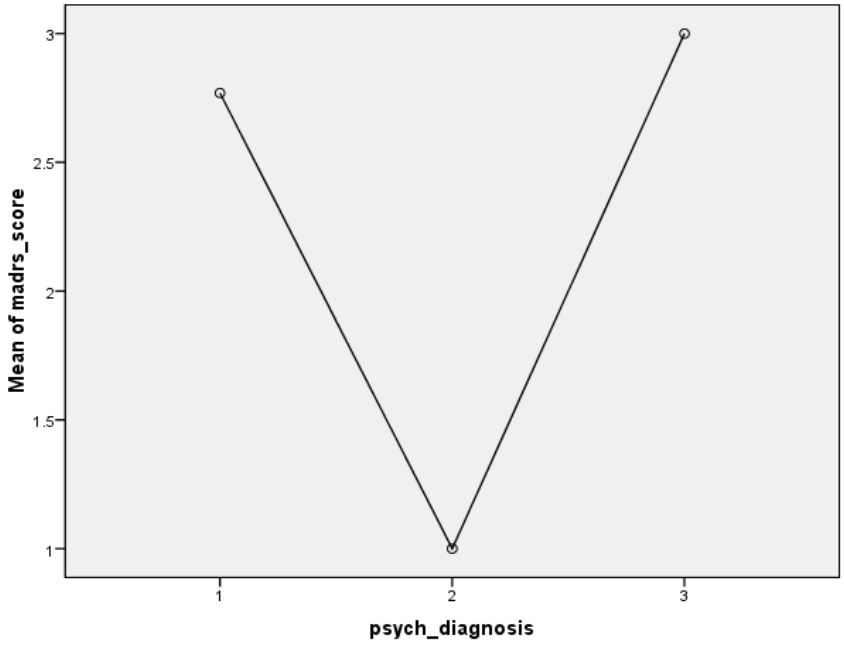
Table 10: Descrpitive anxiety and depression severity scores

		N	Mean	Std. Deviation	Std. Error
MADRS_score	Normal	13	2.77	.599	.166
	Mild	1	1.00	.	.
	Moderate	4	3.00	.816	.408
	Total	18	2.72	.752	.177
HAM A_score	mild	0	.	.	.
	moderate	4	2.00	.000	.000
	severe	4	2.00	.816	.408
	Total	8	2.00	.535	.189

The mean number of patients suffering from mild, moderate and severe depression are 1 and 4 respectively. The mean number of patients suffering from moderate and severe anxiety are both 4 respectively.

Anova		Sum of Squares	df	Mean Square	F	Sig.
MADRS_score	Between Groups	3.303	2	1.652	3.928	.042
	Within Groups	6.308	15	.421		
	Total	9.611	17			
HAMA_score	Between Groups	.000	1	.000	.000	1.000
	Within Groups	2.000	6	.333		
	Total	2.000	7			

It was shown that severity depressive symptoms were statistically significant (p=0.04) where as the severity of anxiety symptoms were not.



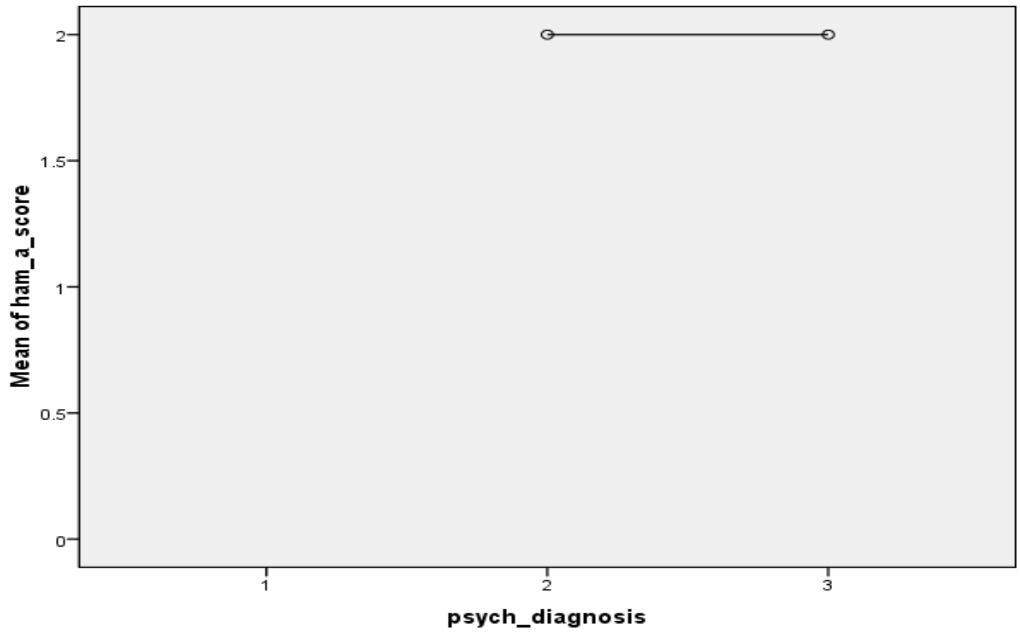


Table 11 :Relationship between duration of rheumatoid arthritis and presence of psychiatric diagnosis

	Psychiatric diagnosis	N	Mean	Std. Deviation	Std. Error Mean
Duration (months)	Present	21	50.24	29.965	6.539
	absent	35	31.29	17.924	3.030

Independent Samples Test

		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
duration_mths	Equal variances assumed	.004	18.952	6.384

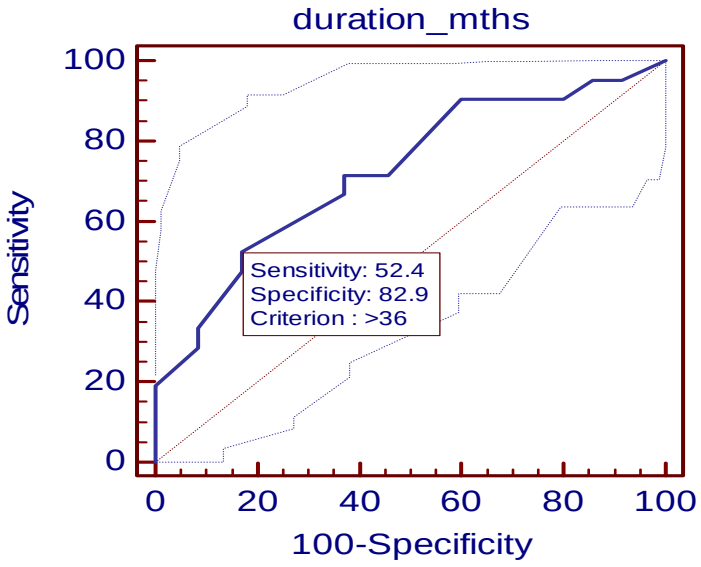
Independent Samples Test

		t-test for Equality of Means		
		Sig. (2-tailed)	**Mean Difference**	**Std. Error Difference**
duration_mths	Equal variances assumed	.004	18.952	6.384
	Equal variances not assumed	.014	18.952	7.207

It was noticed that a mean duration of 50 months in all those who were suffering from a psychiatric diagnosis. It is also noteworthy that individuals suffering from rheumatoid arthritis upto 31.2 months were not suffering from psychiatric morbidity (p=0.04)

An ROC curve was plotted to assess the relationship between the duration of psychiatric diagnosis and duration of illness

Graph : ROC CURVE



Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.723129
Standard Error[a]	0.0721
95% Confidence interval[b]	0.587323 to 0.834320
z statistic	3.093
Significance level P (Area=0.5)	0.0020

Area under the curve was 0.72 and it is a significant finding. It was also found that a minimum duration of 36 months is required to have a psychiatric diagnosis in individuals with rheumatoid arthritis. The specificity was found to be 82.9%.

Possibility of having permutations and combinations of having a different dinosis when duration is considered.

Table 12: Post Hoc Tests (Multiple comparison

(I) psychiatric_ diagnosis	(J) psychiatric_ diagnosis	Mean Difference (I-J)	Std. Error	Sig.
No diagnosis	depression	-16.868*	7.623	.031
	Anxiety	-18.964	12.387	.132
	Both	-25.714*	12.387	.043
Depression	No diagnosis	16.868*	7.623	.031
	Anxiety	-2.096	13.419	.876
	Both	-8.846	13.419	.513
Anxiety	No diagnosis	18.964	12.387	.132
	Depression	2.096	13.419	.876
	Both	-6.750	16.595	.686
Both	No diagnosis	25.714*	12.387	.043
	Depression	8.846	13.419	.513
	Anxiety	6.750	16.595	.686

- *. The mean difference is significant at the 0.05 level.

It was analysed that the probability of having depression or anxiety in individuals with no psychiatric diagnosis was not statistically significant. P value was found to be 0.031 and 0.043 respectively. It was also found out that chance of individuals having no diagnosis among the

depressed were not significant (p=0.031).Among the individuals having both depression and anxiety there was less possibility of having a nil psychiatry diagnosis (p=0.043)

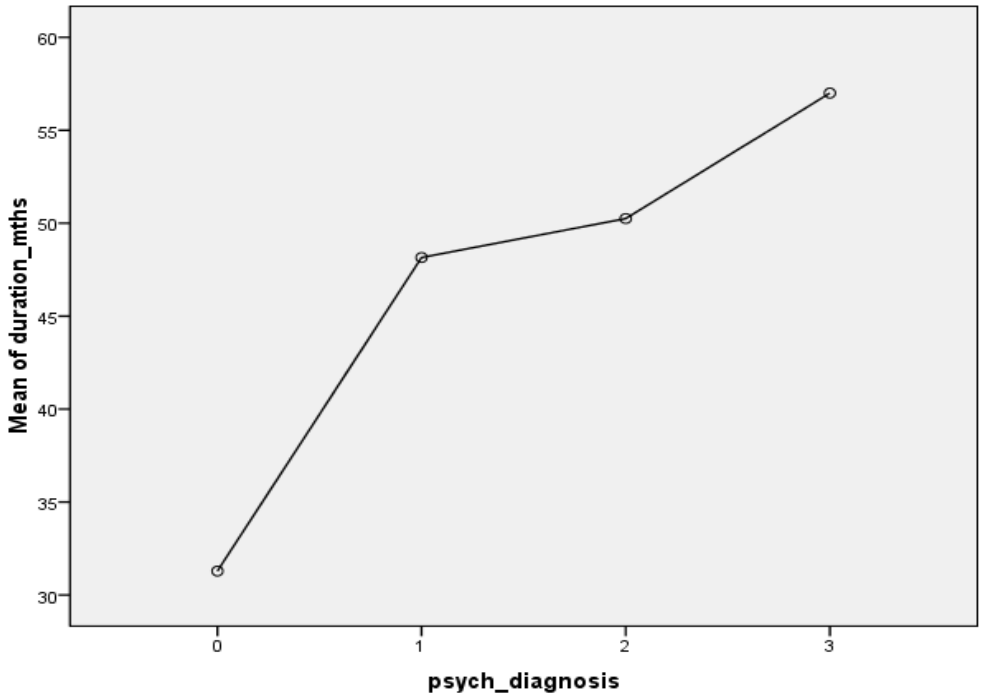


Table 13:Relationship between duration of rheumatoid arthritis and GHQ 12 scores

	GHQ12_score	N	Mean	Std. Deviation	Std. Error Mean
duration_mth	Significant	27	46.52	28.711	5.525
	Not significant	29	30.83	17.647	3.277

Independent Samples Test

		t-test for Equality of Means		
		Sig. (2-tailed)	**Mean Difference**	**Std. Error Difference**
duration_ mths	Equal variances assumed	.016	15.691	6.319
	Equal variances not assumed	.019	15.691	6.424

A mean duration of 46.5 months is required for significant results in GHQ12 questionnaire. It was found to be statistically significant ($p < 0.05$)

Table 14: Relationship between duration of illness and severity of depression.

Correlations

		madrs_ score	**duration_ mths**
madrs_ score	Pearson Correlation	1	.221
	Sig. (2-tailed)		.377
	N	18	18
duration_ mths	Pearson Correlation	.221	1
	Sig. (2-tailed)	.377	
	N	18	56

It was found that there is no statistical significance between duration of illness and severity of depression (p = 0.37).

Table 15: Relationship between duration of illness and severity of anxiety

Correlations

		duration_ mths	ham_a_ score
duration_mths	Pearson Correlation	1	-.659
	Sig. (2-tailed)		.075
	N	56	8
ham_a_score	Pearson Correlation	-.659	1
	Sig. (2-tailed)	.075	
	N	8	8

It was found that there is no statistical significance between duration of illness and severity of anxiety (p = 0.075)

Table 16: Relationship between severity of rheumatoid arthritis and sex

Crosstab1

		das_28_score			
		mild	**moderate**	**severe**	**Total**
Female	Count	11	29	11	51
	% within sex	21.6%	56.9%	21.6%	100.0%
	% within das_28_score	91.7%	90.6%	91.7%	91.1%
	% of Total	19.6%	51.8%	19.6%	91.1%
Male	Count	1	3	1	5
	% within sex	20.0%	60.0%	20.0%	100.0%
	% within das_28_score	8.3%	9.4%	8.3%	8.9%
	% of Total	1.8%	5.4%	1.8%	8.9%
Total	Count	12	32	12	56
	% within sex	21.4%	57.1%	21.4%	100.0%
	% within das_28_score	100.0%	100.0%	100.0%	100.0%
	% of Total	21.4%	57.1%	21.4%	100.0%

Chi square= 0.018 p=0.991

Among females 21.6 %, 56.9% and 21.6% were having mild, moderate and severe rheumatoid arthritis respectively

Table 17: Relationship between severity of rheumatoid arthritis and age

Crosstab

			das_28_score			
			mild	moderate	severe	Total
age group	17-39	Count	5	9	4	18
		% within age group	27.8%	50.0%	22.2%	100.0%
		% within das_28_score	41.7%	28.1%	33.3%	32.1%
		% of Total	8.9%	16.1%	7.1%	32.1%
	40-49	Count	5	12	6	23
		% within age group	21.7%	52.2%	26.1%	100.0%
		% within das_28_score	41.7%	37.5%	50.0%	41.1%
		% of Total	8.9%	21.4%	10.7%	41.1%
	>/=50	Count	2	11	2	15
		% within age group	13.3%	73.3%	13.3%	100.0%
		% within das_28_score	16.7%	34.4%	16.7%	26.8%
		% of Total	3.6%	19.6%	3.6%	26.8%
	Total	Count	12	32	12	56
		% within age group	21.4%	57.1%	21.4%	100.0%
		% within das_28_score	100.0%	100.0%	100.0%	100.0%
		% of Total	21.4%	57.1%	21.4%	100.0%

There was no statistical significance between age and severity of rheumatoid arthritis ($p>0.05$)

Table 18: Relationship between severity of rheumatoid arthritis and occupation

			das_28_score			
			Mild	**moderate**	**severe**	**Total**
occupation	Manual labourer	Count	1	7	2	10
		% within occupation	10.0%	70.0%	20.0%	100.0%
		% within das_28_score	8.3%	21.9%	16.7%	17.9%
		% of Total	1.8%	12.5%	3.6%	17.9%
	House wife	Count	7	14	6	27
		% within occupation	25.9%	51.9%	22.2%	100.0%
		% within das_28_score	58.3%	43.8%	50.0%	48.2%
		% of Total	12.5%	25.0%	10.7%	48.2%
	House maid	Count	0	7	3	10
		% within occupation	.0%	70.0%	30.0%	100.0%
		% within das_28_score	.0%	21.9%	25.0%	17.9%
		% of Total	.0%	12.5%	5.4%	17.9%
	unemployed	Count	1	0	0	1
		% within occupation	100.0%	.0%	.0%	100.0%

		% within das_28_score	8.3%	.0%	.0%	1.8%
		% of Total	1.8%	.0%	.0%	1.8%
	others	Count	3	4	1	8
		% within occupation	37.5%	50.0%	12.5%	100.0%
		% within das_28_score	25.0%	12.5%	8.3%	14.3%
		% of Total	5.4%	7.1%	1.8%	14.3%
	Total	Count	12	32	12	56
		% within occupation	21.4%	57.1%	21.4%	100.0%
		% within das_28_score	100.0%	100.0%	100.0%	100.0%
		% of Total	21.4%	57.1%	21.4%	100.0%

There was no statistical significance between age and severity of rheumatoid arthritis ($p>0.05$)

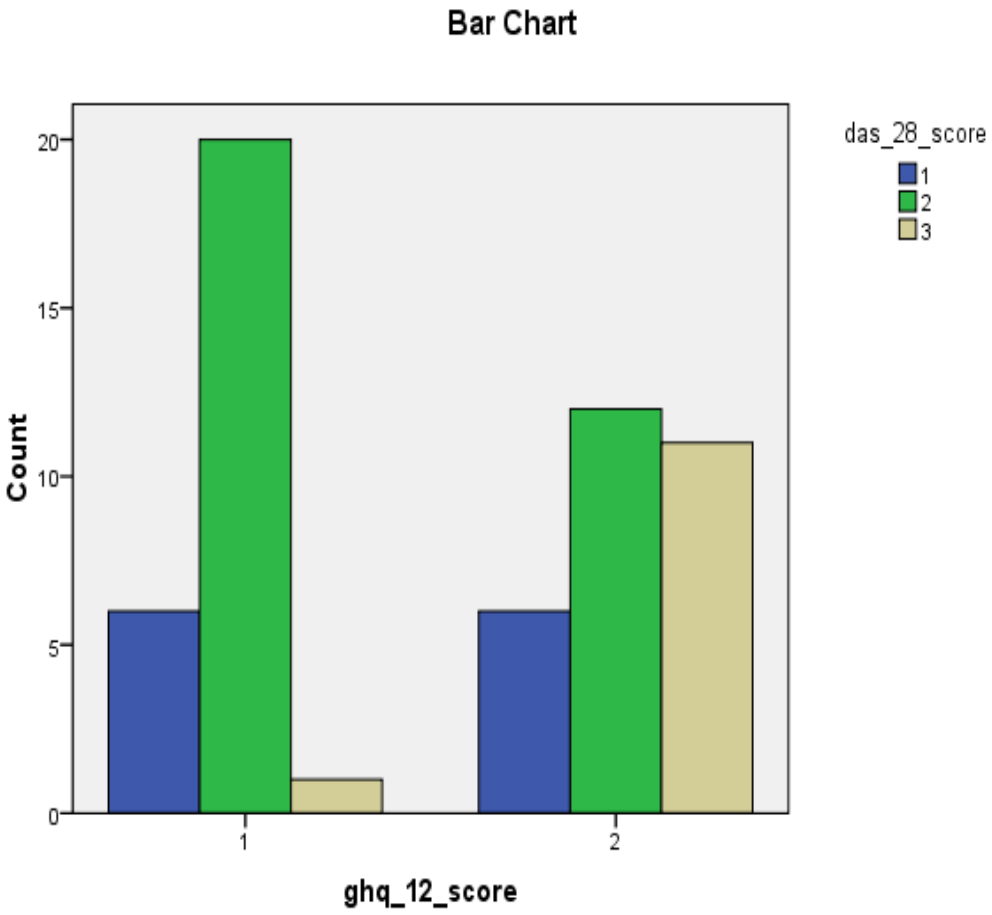
Table 19: Relationship between DAS 28 and GHQ 12 score

			das_28_score			
			mild	**moderate**	**severe**	**Total**
ghq_12_score	Significant	Count	6	20	1	27
		% within ghq_12_score	22.2%	74.1%	3.7%	100.0%
		% within das_28_score	50.0%	62.5%	8.3%	48.2%
		% of Total	10.7%	35.7%	1.8%	48.2%
	Not significant	Count	6	12	11	29
		% within ghq_12_score	20.7%	41.4%	37.9%	100.0%
		% within das_28_score	50.0%	37.5%	91.7%	51.8%
		% of Total	10.7%	21.4%	19.6%	51.8%
	Total	Count	12	32	12	56
		% within ghq_12_score	21.4%	57.1%	21.4%	100.0%
		% within das_28_score	100.0%	100.0%	100.0%	100.0%
		% of Total	21.4%	57.1%	21.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.275[a]	2	.006
Likelihood Ratio	11.701	2	.003
Linear-by-Linear Association	4.097	1	.043
N of Valid Cases	56		

It has been found that there is a significant correlation between severity of rheumatoid arthritis and psychological distress -GHQ 12 ($p<0.05$)



Graph 1-mild RA, 2- moderate RA, 3- severe RA

Table 20: Relationship between DAS 28 and psychiatric diagnosis

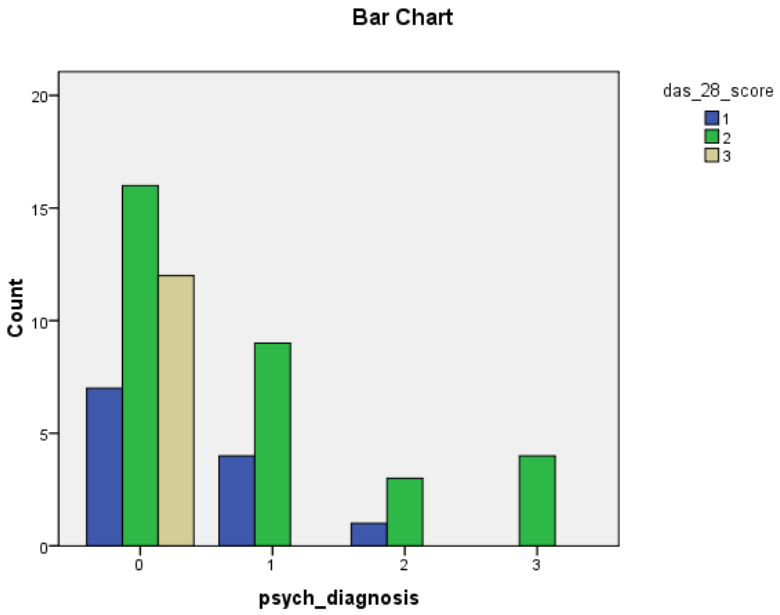
			das_28_score			
			mild	moderate	severe	Total
psych_diagnosis	No diagnosis	Count	7	16	12	35
		% within psych_diagnosis	20.0%	45.7%	34.3%	100.0%
		% within das_28_score	58.3%	50.0%	100.0%	62.5%
		% of Total	12.5%	28.6%	21.4%	62.5%
	Depression	Count	4	9	0	13
		% within psych_diagnosis	30.8%	69.2%	.0%	100.0%
		% within das_28_score	33.3%	28.1%	.0%	23.2%
		% of Total	7.1%	16.1%	.0%	23.2%
	Anxiety	Count	1	3	0	4
		% within psych_diagnosis	25.0%	75.0%	.0%	100.0%
		% within das_28_score	8.3%	9.4%	.0%	7.1%
		% of Total	1.8%	5.4%	.0%	7.1%
	3	Count	0	4	0	4
		% within psych_diagnosis	.0%	100.0%	.0%	100.0%
		% within das_28_score	.0%	12.5%	.0%	7.1%
		% of Total	.0%	7.1%	.0%	7.1%
	Total	Count	12	32	12	56
		% within psych_diagnosis	21.4%	57.1%	21.4%	100.0%
		% within das_28_score	100.0%	100.0%	100.0%	100.0%

			das_28_score			
			mild	moderate	severe	Total
psych_diagnosis	No diagnosis	Count	7	16	12	35
		% within psych_diagnosis	20.0%	45.7%	34.3%	100.0%
		% within das_28_score	58.3%	50.0%	100.0%	62.5%
		% of Total	12.5%	28.6%	21.4%	62.5%
	Depression	Count	4	9	0	13
		% within psych_diagnosis	30.8%	69.2%	.0%	100.0%
		% within das_28_score	33.3%	28.1%	.0%	23.2%
		% of Total	7.1%	16.1%	.0%	23.2%
	Anxiety	Count	1	3	0	4
		% within psych_diagnosis	25.0%	75.0%	.0%	100.0%
		% within das_28_score	8.3%	9.4%	.0%	7.1%
		% of Total	1.8%	5.4%	.0%	7.1%
	3	Count	0	4	0	4
		% within psych_diagnosis	.0%	100.0%	.0%	100.0%
		% within das_28_score	.0%	12.5%	.0%	7.1%
		% of Total	.0%	7.1%	.0%	7.1%
	Total	Count	12	32	12	56
		% within psych_diagnosis	21.4%	57.1%	21.4%	100.0%
		% within das_28_score	100.0%	100.0%	100.0%	100.0%
		% of Total	21.4%	57.1%	21.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.285[a]	6	.080
Likelihood Ratio	15.939	6	.014
Linear-by-Linear Association	1.811	1	.178
N of Valid Cases	56		

There is a significant likelihood ratio in the correlation between severity of rheumatoid arthritis and psychiatric diagnosis ($p<0.014$)



Graph 2-mild ra, 2- moderate ra, 3- severe ra

It was found that there exists no statistical correlation between severity of depression, anxiety or both with severity of rheumatoid arthritis

Table 21: Quality of life in rheumatoid arthritis in relation with severity of illness

		N	Mean	Std. Deviation	Std. Error
SF 36(Total)	mild	12	52.316667	16.6733229	4.8131737
	moderate	32	48.892187	21.1674459	3.7419111
	severe	12	62.912500	16.7482716	4.8348096
	Total	56	52.630357	19.8862431	2.6574110
Physical functioning	Mild	12	6.833	1.8627	.5377
	moderate	32	6.281	2.2823	.4034
	severe	12	6.833	1.4668	.4234
	Total	56	6.518	2.0337	.2718
Role limitation due to physical health	mild	12	8.33	28.868	8.333
	moderate	32	13.75	31.392	5.549
	Severe	12	25.00	45.227	13.056
	Total	56	15.00	34.112	4.558
Role limitation due to emotional problem	Mild	12	33.333333	49.2365964	14.2133811
	Moderate	32	16.665625	36.9048962	6.5239256
	Severe	12	27.775000	44.5701515	12.8662945
	Total	56	22.617857	41.2464879	5.5117938

Energy/fatigue	Mild	12	55.00	23.932	6.908
	Moderate	32	47.50	25.996	4.596
	Severe	12	62.08	23.593	6.811
	Total	56	52.23	25.351	3.388
Emotional wellbeing	mild	12	68.33	18.642	5.381
	moderate	32	56.50	25.273	4.468
	severe	12	82.83	16.010	4.622
	Total	56	64.68	24.383	3.258
Social functioning	mild	12	54.167	22.8218	6.5881
	moderate	32	51.953	24.2029	4.2785
	severe	12	67.708	17.2369	4.9759
	Total	56	55.804	23.1060	3.0877
pain	mild	12	49.792	23.8236	6.8773
	moderate	32	46.172	21.4681	3.7951
	severe	12	71.667	19.8097	5.7186
	Total	56	52.411	23.5968	3.1533
General health	mild	12	43.750	15.9723	4.6108
	moderate	32	42.266	16.5996	2.9344
	severe	12	56.667	20.4865	5.9139
	Total	56	45.670	18.0056	2.4061

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SF 36(Total)	Between Groups	1717.016	2	858.508	2.271	.113
	Within Groups	20033.431	53	377.989		
	Total	21750.447	55			
Physical functioning	Between Groups	4.180	2	2.090	.496	.612
	Within Groups	223.302	53	4.213		
	Total	227.482	55			
Role limitation due to physical health	Between Groups	1783.333	2	891.667	.760	.473
	Within Groups	62216.667	53	1173.899		
	Total	64000.000	55			
Role limitation due to emotional problem	Between Groups	2830.741	2	1415.370	.827	.443
	Within Groups	90739.261	53	1712.062		
	Total	93570.002	55			
Energy / Fatigue	Between Groups	1973.065	2	986.533	1.567	.218
	Within Groups	33372.917	53	629.678		
	Total	35345.982	55			
Emotional well being	Between Groups	6255.881	2	3127.940	6.270	.004
	Within Groups	26442.333	53	498.912		
	Total	32698.214	55			

Social functioning	Between Groups	2207.264	2	1103.632	2.154	.126
	Within Groups	27156.576	53	512.388		
	Total	29363.839	55			
pain	Between Groups	5777.353	2	2888.677	6.162	.004
	Within Groups	24847.201	53	468.815		
	Total	30624.554	55			
General health	Between Groups	1866.230	2	933.115	3.098	.053
	Within Groups	15964.909	53	301.225		
	Total	17831.138	55			

It has been found out that there exists a positive correlation between the components of emotional well being and pain of the SF 36 scale with severity of rheumatoid arthritis ($p<0.05$). Mean quality of life of those individuals suffering from mild, moderate and severe rheumatoid arthritis was found to be 52.31%, 48.89 %and 62.9% respectively. The mean quality of life was found to be 52.6%.

DISCUSSION

Rheumatoid arthritis is an important chronic general medical condition with varying disability that can cause various social psychological stressors. These stressors have direct effect on patient management. The severity and duration of the medical condition has direct effect on mental health.

As has been mentioned in majority of studies, depression and anxiety are the common co morbidities in patients suffering from rheumatoid arthritis. The study sample consisted a majority of females; most of them belonging to 40-50 years of age. The mean duration of rheumatoid arthritis was 38 months. Most of them were on treatment with corticosteroids and disease modifying anti rheumatic agents. Disease activity was found to be moderate in majority of the patients. 78.5% of the study population was having moderate to severe rheumatoid arthritis.

A mean duration of 46 months was required for a significant result in general health questionnaire. It is a finding in the study that there is a significant correlation between disease severity and psychological distress measured by general health questionnaire 12. Similar finding was

come across by Kolahi et al in Iran where he compared disease severity and psychological distress.

It was noted in the study that individuals with illness duration of 31.2 months were not suffering from any psychiatric diagnosis and it was noted that a minimum duration of 36 months is required to develop a psychiatric diagnosis.

The prevalence of depression as proposed in multiple studies was in the range of 28%-44% (Irik et al, Zyrianova et al, Arg et al, Keslar et al). This study reveals a prevalence of 23.2% which is relatively less when compared with previous studies. Among the patients suffering from depressive disorder most of them belonged to the category of moderate depressive disorder. Recurrent depressive episode was noted in 22.2% of the patients suffering from depressive disorder, who were currently having an episode of moderate depression. Pain is an important factor associated with depressive symptoms along with limited role functioning. Lack of social support adds to it.

It has been elicited that depression is associated with poor help seeking behaviour and poor compliance. Hence it is of utmost importance to be in vigil for the onset of a depressive disorder during the treatment course of rheumatoid arthritis.

Prevalence of anxiety have been reported differently across studies conducted. Zyrianova et al had demonstrated a higher prevalence rate of 44% of anxiety disorder where as Isik et al had demonstrated a lower prevalence rate of 13.4%. This study has reported a prevalence rate of 7.1% of anxiety disorder in the study sample and all of them met the criteria of generalised anxiety disorder. Isik et al had described the prevalence of 15.9% of mixed anxiety and depression. This study showed a prevalence of 7.1% which is significantly low when compared with other studies. It is also noted that the chance of co-occurence of depression and anxiety symptoms is relatively common in rheumatoid arthritis.

When the severity of depressive of depressive and anxiety symptoms were assessed moderate depression was found to be prevalent. There was no variation in the severity of anxiety symptoms in patients diagnosed with anxiety disorder. It was demonstrated that there is no relationship between duration of rheumatoid arthritis and the severity of depression and anxiety as measured by MADRS and HAM-A respectively. Likewise no relationship could be demonstrated with severity of rheumatoid arthritis with severity of depression or anxiety measured by MADRS or HAM-A respectively.

It has been demonstrated that mean quality of life as measured by means of SF 36 scale was 52.6%. Those suffering from severe rheumatoid arthritis were found to have poorer quality of life which is in agreement with previous studies done by Benitha et al, Cadena et al, Michaud et al.It was found that there is a significant correlation of pain factor and emotional well being with quality of life.

LIMITATIONS

This study had the aim of assessing psychiatric co morbidity like depression, anxiety and psychotic symptoms along with quality of life amongst patients suffering from rheumatoid arthritis.

1. The study design was cross sectional.

2. The sample size used for assessment could have been more in order to have a better understanding of the prevalence.

3. If normal control population was selected it would have given a better picture regarding psychiatric manifestations and quality of life. If another chronic rheumatologic disorder like systemic lupus erythematosis was taken as a control group it would have been an added benefit in understanding the psychiatric manifestations.

4. Data used for computation of results were basic clinical examination laboratory investigations. Availability of latest immunochemistry laboratory techniques would have improved the accuracy of the results.

5. In this study the dose range of steroids was not mentioned. It is evident from the literature that corticosteroids have significant neuropsychiatric effects.

6. A longitudinal study design would have thrown more light into the psychiatric manifestations than a cross sectional design.

7. There is a bias in the recall of events being a retrospective design.

8. This study is done in an outpatient department of a tertiary centre and it cannot be generalised to community settings.

SUMMARY AND CONCLUSION

Rheumatoid arthritis, a multisystem disease has a variable course characterised by exacerbations and remissions; during the course of the illness, psychiatric manifestations are not uncommon. The present study has the objective of assessing the psychiatric manifestations, in particular, anxiety, depression, psychotic symptoms and quality of life among patients with rheumatoid arthritis.

A cross sectional design was employed for the study, in which fifty six consecutive patients with rheumatoid arthritis attending the Rheumatology outpatient department at the Government Kilpauk medical college hospital, Chennai constituted the cases.

Patients were administered a semi structured interview schedule that collected demographic, personal data; in addition relevant clinical data was gathered from the patients with rheumatoid arthritis. They were interviewed using general health questionnaire 12 to evaluate for psychiatric morbidity. Those who scored a significant score in the GHQ 12 were interviewed in detail to diagnose a psychiatric disorder. If a diagnosis was made the severity of psychiatric morbidity was measured.Montgomery Asberg depression rating scale was used to measure the severity of depression, Hamilton anxiety rating scale for

anxiety and Brief psychiatric rating scale for psychotic illness. Short form 36 was used to measure the quality of life in these patients. Further, the cases were assessed using Disease activity score 28 (DAS28). The subjects provided written consent for participation in the study. The study design and protocol was approved by the Institutional Ethical Committee, Kilpauk Medical College vide letter dated 26/03/2015. Significance level was set at $p < 0.05$.

The study sample consisted a majority of females; most of them belonging to 40-50 years of age. The mean duration of rheumatoid arthritis was 38 months. Most of them were on treatment with corticosteroids and disease modifying anti rheumatic agents. Disease activity was found to be moderate in majority of the patients. 78.5% of the study population was having moderate to severe rheumatoid arthritis. A mean duration of 46 months was required for a significant result in general health questionnaire. It is a finding in the study that there is a significant correlation between disease severity and psychological distress measured by general health questionnaire 12. A minimum duration of 36 months is required to develop a psychiatric diagnosis.

This study reveals a prevalence of 23.2% which is relatively less when compared with previous studies. Among the patients suffering from depressive disorder most of them belonged to the category of moderate

depressive disorder. Recurrent depressive episode was noted in 22.2% of the patients suffering from depressive disorder. This study has reported prevalence rate of anxiety as 7.1% in the study sample and all of them met the criteria of generalised anxiety disorder. This study showed a prevalence of 7.1% of mixed anxiety and depression. It was demonstrated that there is no relationship duration of rheumatoid arthritis with the severity of depression and anxiety as measured by MADRS and HAM-A respectively. Likewise no relationship could be demonstrated with severity of rheumatoid arthritis with severity of depression or anxiety measured by MADRS or HAM-A respectively.

It has been demonstrated that mean quality of life as measured by means of SF 36 scale was 52.6%. Those suffering from severe rheumatoid arthritis were found to have poorer quality of life.

A considerable portion of patients with RA may have mental health problems. Likelihood of patients suffering from mental health problems was more likely with longer duration of illness. Depressive disorder and anxiety disorder is present in more than a third of patients suffering from rheumatoid arthritis. The severity of the psychiatric diagnosis is directly related with duration of illness. Hence it is important to screen them for psychological distress at regular time intervals.Apart from treating

primary rheumatoid arthritis identification and treatment of secondary / co-morbid psychiatric disorder would be a holistic approach for better health care delivery system for patients suffering from rheumatoid arthritis.

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APPENDIX I

PATIENT PROFORMA

Name : Age:

Sex : education: Address:

Income: Marital Status:

Occupation:

Diagnosis:

Duration:

Treatment details & smoking status

DAS28 score:

GHQ 12 score:

ICD-10 diagnosis:

Severity measurement details(Psychological):-

Comorbid metabolic illness:

APPENDIX II

General Health Questionnaire 12

1. Been able to concentrate on whatever you are doing

2. Lost much sleep over worry

3. Felt that you are playing a useful part in things

4. Felt capable of making decisions about things

5. Felt constantly under strain

6. Felt you couldn’t overcome your difficulties

7. Been able to enjoy your normal day to day activities

8. Been able to face up to your problems

9. Been feeling unhappy and depressed

10. Been losing confidence in yourself

11. Been thinking of yourself as a worthless person

12. Been feeling reasonably happy, all things

APPENDIX III

Hamilton anxiety rating scale (HAM – A)

Sl. no	items	0	1	2	3	4
1	Anxious mood					
2	Tension					
3	Fears					
4	Insomnia					
5	Intellectual					
6	Depressed mood					
7	Somatic complaints :Muscular					
8	Somatic complaints : sensory					
9	cardiovascular					
10	Respiratory					
11	G.I					
12	Genitourinary					
13	Autonomic					
14	Behaviour at interview					

APPENDIX IV

Disease activity score in 28 joints

FORM A		LEFT		RIGHT	
		SWOLLEN	TENDER	SWOLLEN	TENDER
Shoulder					
Elbow					
Wrist					
Metacarpophalangeal (MCP)	1				
	2				
	3				
	4				
	5				
Proximal Interphalangeal (PIP)	1				
	2				
	3				
	4				
	5				
Knee					
Subtotal					
TOTAL		SWOLLEN		TENDER	

FORM B	
Swollen (0–28)	
Tender (0–28)	
ESR (or CRP)	
VAS disease activity (0–100mm)	
DAS28=0.56*√(TENDER JOINTS) + 0.28* √(SWOLLEN JOINTS) + 0.70*LN(ESR/CRP) + 0.014*VAS	

APPENDIX V

Brief psychiatric rating scale

SL NO	ITEMS	0	1	2	3	4	5	6	7
1	Somatic concern								
2	Anxiety								
3	Emotional withdrawal								
4	Conceptual disorganisation								
5	Guilt feelings								
6	Tension								
7	Mannerisms & posturing								
8	Grandiosity								
9	Depressive mood								
10	Hostility								
11	Suspiciousness								
12	Hallucinatory behavior								
13	Motor retardation								
14	Uncooperativeness								
15	Unusual thought content								
16	Blunted affect								
17	Excitement								
18	Disorientation								

APPENDIX VI

Short form 36

1	**In general, would you say your health is:** Excellent (1) Very good (2) Good (3) Fair (4) Poor (5)		
2	**Compared to one year ago, how would your rate your health in general now?** Much better now than one year ago (1) Somewhat better now than one year ago (2) About the same (3) Somewhat worse now than one year ago (4) Much worse now than one year ago (5)		

3	**Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
4	**Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
5	**Lifting or carrying groceries** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
6	**Climbing several flights of stairs** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
7	**Climbing one flight of stairs** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
8	**Bending, kneeling, or stooping** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		

9	**Walking more than a mile** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
10	**Walking several blocks** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
11	**Walking one block** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		
12	**Bathing or dressing yourself** Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)		

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

13	**Cut down the amount of time you spent on work or other activities** Yes (1) No (2)		
14	**Accomplished less than you would like** Yes (1) No (2)		
15	**Were limited in the kind of work or other activities** Yes (1) No (2)		

16	**Had difficulty performing the work or other activities (for example, it took extra effort)** Yes (1) No (2)		

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

17	**Cut down the amount of time you spent on work or other activities** Yes (1) No (2)		
18	**Accomplished less than you would like** Yes (1) No (2)		
19	**Didn't do work or other activities as carefully as usual** Yes (1) No (2)		
20	**During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?** Not at all (1) Slightly (2) Moderately (3) Quite a bit (4) Extremely (5)		

21	**How much bodily pain have you had during the past 4 weeks?** None (1) Very mild (2) Mild (3) Moderate (4) Severe (5) Very severe(6)		
22	**During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?** Not at all (1) Slightly (2) Moderately (3) Quite a bit (4) Extremely (5)		
	These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.		
23	**Did you feel full of pep?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		

24	**Have you been a very nervous person?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		
25	**Have you felt so down in the dumps that nothing could cheer you up?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		
26	**Have you felt calm and peaceful?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		

27	**Did you have a lot of energy?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		
28	**Have you felt downhearted and blue?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		
29	**Did you feel worn out?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		
30	**Have you been a happy person?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		

31	**Did you feel tired?** All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)		
32	**During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?** All of the time (1) Most of the time (2) Some of the time (3) A little of the time (4)		
How TRUE or FALSE is each of the following statements for you?			
33	**I seem to get sick a little easier than other people.** Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false (5)		
34	**I am as healthy as anybody I know.** Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false (5)		

35	**I expect my health to get worse.** Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false (5)		
36	**My health is excellent.** Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false (5)		

APPENDIX VII

Montgomery-Asberg Depression Scale (MADRS)

Instructions: The ratings should be based on a clinical interview moving from broadly phrased questions about symptoms to more detailed ones which allow a precise rating of severity. The rater must decide whether the rating lies on the defined scale steps (0, 2, 4, 6) or between them (1, 3, 5). It is important to remember that it is only rare occasions that a depressed patient is encountered who cannot be rated on the items in the scale. If definite answers cannot be elicited from the patients, all relevant clues as well as information from other sources should be used as a basis for the rating in line with customary clinical practice. This scale may be used for any time interval between ratings, be it weekly or otherwise, but this must be recorded.

1. ***Apparent Sadness***

Representing despondency, gloom and despair, (more than just ordinary transient low spirits) reflected in speech, facial expression, and posture. Rate on depth and inability to brighten up.

0 No sadness
1
2 Looks dispirited but does brighten up without difficulty.
3
4 Appears sad and unhappy most of the time.
5
6 Looks miserable all the time. Extremely despondent.

2. ***Reported Sadness***

Representing reports of depressed mood, regardless of whether it is reflected in appearance or not. Includes low spirits, despondency or feeling of being beyond help without hope. Rate according to intensity, duration and the extent to which the mood is reported to be influenced by events.

0 Occasional sadness in keeping with the circumstances.
1
2 Sad or low but brightens up without difficulty.
3
4 Pervasive feelings of sadness or gloominess. The mood is still influenced by external circumstances.
5
6 Continuous or unvarying sadness, misery or despondency.

3. ***Inner Tension***

Representing feelings of ill-defined discomfort, edginess, inner turmoil mounting to either panic, dread or anguish. Rate according to intensity, frequency, duration and the extent of reassurance called for.

0 Placid. Only reflecting inner tension.
1
2 Occasional feelings of edginess and ill-defined discomfort.
3
4 Continuous feelings of inner tension or intermittent panic which the patient can only master with some difficulty.
5
6 Unrelenting dread or anguish. Overwhelming panic.

4. ***Reduced Sleep***

Representing the experience of reduced duration or depth of sleep compared to the subject's own normal pattern when well.

0 Sleeps as usual.
1
2 Slight difficulty dropping off to sleep or slightly reduced light or fitful sleep.
3
4 Sleep reduced or broken by at least two hours.
5
6 Less than two or three hours sleep.

5. ***Reduced Appetite***

Representing the feeling of loss of appetite compared with when well. Rate by loss of desire for food or the need to force oneself to eat.

0 Normal or increased appetite.
1
2 Slightly reduced appetite.
3
4 No appetite. Food is tasteless.
5
6 Needs persuasion to eat.

6. ***Concentration Difficulties***

Representing difficulties in collecting one's thoughts mounting to incapacitating lack of concentration. Rate according to intensity, frequency, and degree of incapacity produced.

0 No difficulties in concentrating.
1
2 Occasional difficulties in collecting one's thoughts.
3
4 Difficulties in concentrating and sustaining thought which reduces ability to read or hold a conversation.
5
6 Unable to read or converse without great initiative.

7. ***Lassitude***

Representing a difficulty getting started or slowness initiating and performing everyday activities.

0 Hardly no difficulty in getting started. No sluggishness.
1
2 Difficulties in starting activities.
3
4 Difficulties in starting simple routine activities which are carried out with effort.
5
6 Complete lassitude. Unable to do anything without help.

8. ***Inability to Feel***

Representing the subjective experience of reduced interest in the surroundings, or activities that normally give pleasure. The ability to react with adequate emotion to circumstances or people is reduced.

0 Normal interest in the surroundings and in other people.
1
2 Reduced ability to enjoy usual interest.
3
4 Loss of interest in surroundings. Loss of feelings for friends and acquaintances.
5
6 The experience of being emotionally paralyzed, inability to feel anger, grief or pleasure and a complete or even painful failure to feel for close relatives and friends.

9. ***Pessimistic Thoughts***

Representing thoughts of guilt. Inferiority, self-reproach, sinfulness, remorse and ruin.

0 No pessimistic thoughts.
1
2 Fluctuating ideas of failure, self-reproach or self-depreciation.
3
4 Persistent self-accusations, or definite but still rational ideas of guilt or sin. Increasingly pessimistic about the future.
5
6 Delusions of ruin, remorse or unredeemable sin. Self-accusations which are absurd and unshakable.

10. ***Suicidal Thoughts***

Representing the feeling that life is not worth living, that a natural death would be welcome, suicidal thoughts, and the preparations for suicide. Suicidal attempts should not in themselves influence the rating.

0 Enjoys life or takes it as it comes.
1
2 Weary of life. Only fleeting suicidal thoughts.
3
4 Probably better off dead. Suicidal thoughts are common, and suicide is considered as a possible solution, but without specific plans or intention.
5
6 Explicit plans for suicide when there is an opportunity. Active preparations for suicide.

Total Score:_____

APPENDIX VIII

PATIENT CONSENT FORM:

Study detail : Psychiatric morbidity and quality of life in individuals with Rheumatoid arthritis:A cross sectional study

Study place : Govt. kilpauk medical college hospital

Patient's Name :

Patient's Age :

Identification Number :

Patient may check (✓) these boxes

- I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ☐
- I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ☐
- I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well-being or any unexpected or unusual symptoms. ☐
- I hereby consent to participate in this study. ☐
- I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological tests. ☐

Signature/thumb impression:

Patients Name and Address: Place: Date:

Name and Signature of investigator :

ஆராய்ச்சி தகவல் தாள்

ஆய்வாளர் :

பங்கேற்பாளர் பெயர் :

தலைப்பு :

ஆராய்ச்சியின் நோக்கம் :

தாங்கள் இந்த மருத்துவ ஆய்வில் கலந்து கொள்ளுமாறு அழைக்கிறோம். இந்த ஆய்வானது எந்தவொரு மருத்துவ தலையீடும் இல்லாதது.

இதில் உங்களுக்கு எந்தவொரு ஆதாயமோ அல்லது ஆபத்தோ இருக்காது.

எங்கள் மையத்தில் நடைபெற இருக்கும் ஓர் ஆராய்ச்சிக்கு உங்கள் ஒத்துழைப்பும், ஒப்புதலையும் வேண்டுகிறோம்.

முடிவுகளை அல்லது கருத்தகளை வெளியிடும் போதோ அல்லது ஆராய்ச்சியின்போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிட மாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆராய்ச்சியிலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த சிறப்புப் பரிசோதனைகளின் முடிவுகளை ஆய்வின் முடிவின்போது தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.