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Prevalence of Depression in Rheumatoid Arthritis Patients in Mosul City and The Effect of Sociodemographic and Rheumatoid Arthritis Related Factors

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ABSTRACT

Depression is a common sequel of Rheumatoid arthritis RA and it is a mental illness characterized by a profound and persistent feeling of sadness or despair and\or loss of interest. Depression is important contributor to poor health outcome ill RA patients.

Objective: to assess the current prevalence of major depression in Patients of RA, and analyzing the effect of sociodemographic and RA related factors on development of major depression.

Method: a randomly selected samples of RA patients visiting rheumatology, unit in Ibn Sina Teaching Hospital in Mosul city (total=200, male=62, female=138) was subjected to the M.I.N.I. questionnaire by direct interview. Data was statistically analyzed by STATISTICA program -version 5.

Results: RA patients was found to be 29% (male 35.5%, female 26.1%). Statistically significant difference was found between ethnic groups, age groups (>40 yrs. is risky), and marital status groups (being widow, divorced or single is risky). Logistic regression showed that risk factors for developing major depression in RA patients were being. widow, divorced or single, as well as having severe form of RA, while being employed was a protective factor against the development of major depression in same patients.

Conclusions: in patients with rheumatoid arthritis it was found that current prevalence of major depression is 29.0%, which is higher than other studies done elsewhere (13-20%). Also, it was found that having the more severe form of rheumatoid arthritis, being a widow, divorced or single, or being 40 year old are risk factors to develop major depression in RA patients, while being employed was a protective factor .

Keywords: Rheumatoid arthritis RA,

1. INTRODUCTION

Rheumatoid arthritis is a chronic disease that leads to chronic articular pain, disability and excess mortality [1]. Most patients have progressive disease, with either slow or rapid course, and individuals with RA experience more psychological distress than healthy individuals [2[. Emotions have been shown to influence adaptations among patients with rheumatic disease [3]. Negative affect has been linked with increase pain [4]. One of the most frequently researched of affective disorders in rheumatic disease patients is 'depression.' (Depressive disorder' is mental illness characterized by a profound and persistent feeling of sadness or despair and\or loss of interest in things that were once pleasurable [5]. Depression adversely impacts the outcomes of comorbid diseases [6]. RA patients exhibiting more depressive symptoms reported higher average pain across weeks, and more affective disturbance in response to pain episodes [7], and the patient's level of depressive feeling was linearly related to the level of functional ability [8].

Rheumatoid Arthritis (RA)

Definition: is a chronic systemic autoimmune inflammatory disease that affects all ethnic groups throughout the world (9). It is one of the most common inflammatory arithritidis [1]. Affected patients suffer from chronic articular pain, disability and excess mortality [1]

Epidemiology: Females are 2.5 times more likely to be affected than males [1,10, 11]. The peak incidence occurs within the fourth or fifth decades of life -but can occur at any age [1, 11]. The overall prevalence is 1-2%, and it is steadily increases to 50/0 in women by age of 70 [10,12,13].

Etlotogy: In general, RA is of an unknown etiology. However, several factors are assumed to contribute to RA pathophysiology [1]:

1- Genetic factors: it contributes to disease susceptibility in RA and risk to developing first-degree relatives of RA is 1.5 folds higher than general population. And concordance rate for monozygotic twins (12-15%) is markedly higher than with for dizygotic twins (3.5%).
2- Non-genetic factors:
   a. Sex: females are 2-3 times higher than males, may be to hormonal affect.
   b. Tobacco: cigarette smoke is one of the most characterized environmental factors that increase risk of RA.
   c. Bacteria and their products: infectious agents are considered as initiating factors for RA. Bacterial DNA has found in synovial tissues of patients.
   d. Viruses: observations suggested relationship between RA and EBV.

Clinical features: Detailed history of articular symptoms is of utmost, with particular focus on mode of onset, which is commonly insidious, occurring over weeks to months [14]. Also the pattern of joint involve, and any variant in symptoms according to the time of day. It is important to remember that RA is systemic disease, and individuals may present with symptoms such as fever weight loss, fatigue [9].

Initial physical examination should be done to gauge the extent of articular and extra-articular involvement. Routine laboratory study at baseline are important in assessing the degree of systemic inflammation, in rating out other potential confounding conditions, and in guiding the use of therapies that have known organ specific toxicity. Radiographic abnormalities are very helpful in diagnosis and treatment of RA [9].

Diagnosis: There is no single clinical, radiological, serological test which enables the diagnosis of RA to be made with certain. The diagnosis depends upon the aggregation of characteristic symptoms, signs, laboratory data, and radiological finding [15]. These findings are incorporated into the Revised 1987 American Rheumatism Association (know American College of Rheumatology) Criteria for classification of RA. (Appendix 1)

Differential diagnosis: Variety of other conditions must be considered in differential diagnosis of RA [15]. These include: connective tissue disease, sarcoidosis, acute viral polyarthritis, hypermobility syndrome and fibromyalgia [16, 17], reactive arthritis [18], psoriatic arthritis [19], crystalline arthritis, infectious arthritis: e.g. tuberculous arthritis [20], osteoarthritis, paraneoplastic disease, multicentric reticulohistiocytosis, fibroblastic rheumatism [21].

Treatment: The classes of drugs used fortreatment ofRA include [22]:

1- Non-steroidal anti-inflammatory drugs (NSAIDs): e.g. piroxicam.
2- Corticosteroid: e.g: prednisolone.
3- Disease -modifying antirheumatic drugs (DMARD): to reduce signs and symptoms of RA and - radiographic progression of joint damage. e.g. methotrexate, and gold therapy.
4- Biologic: structurally engineered version of natural molecule, target pathogenic mediator of joint inflammation and damage. Not used in Iraq yet.

Prognosis: The course of RA is variable [23]. 15-20% have intermittent disease with periods of exacerbations and relatively good prognosis. Most patients have progressive disease, with either slow or rapid course [2]. A classification of progression of RA is mentioned in (Appendix 2).

Depression

Definition: 'depression' is a part of normal experience to feel unhappy at time of adversity [24], while 'depressive disorder' (unipolar depression) are mental illness characterized by a profound and persistent feeling of sadness or despair and\or loss of interest in things that were once pleasurable [5].

Clinical features and diagnosis: Major depression in DSM-IV is manifested with at least five of the nine symptoms, one being a depressed mood or loss of interests/pleasure, present most of the day nearly every day for a minimum of two consecutive weeks [25]. (Appendix 3)

Epidemiology: In USA, major depression has a. point prevalence of approximately 3 to 5 percent ill males and 8 to 10 percent in females [26, 27], and the sarne figures are found in Europe [28]. The lifetime prevalence is about twice the point prevalence [29[. Major depression is less common in older adults, with a rate of approximately 1 to 2 percent [30], though the prevalence is higher in older persons seen in primary care [31]. Depression is more common in populations suffering from a wide range of acute and chronic medical conditions [32]. In general, Major depressive disorder occurs in 4-6% of the general population, in 5-10% of medically ill outpatients, and in 10-30% of hospitalized medical inpatients [33, 34, 35].

Etiology:

1- **Genetic**: Depression is both polygenic and multi-factorial [36, 37].
Concordance rates for depression in monozygotic twins are approximately 50 percent [38].
2- **Personality**: Personality psychology has demonstrated the importance of personality trait vulnerabilities in the onse~ and course of depression [39].
3- **Early environment**: Psychodynamic perspectives have focused on the role of early life losses [40], childhood physical and sexual abuse [41].
4- **Neurobiology**: Multiple lines of evidence demonstrate altered brain structure and function in depression, these include:

- **Neurotransmitters**: Monoamine neurotransmitters, particularly norepinephrine and serotonin, models postulated hypoactivity in these neurotransmitter systems [42].
- **Hypothalamic-pituitary-adrenal axis**: Many depressed patients have hyperactivity of the hypothalamic-pituitary-adrenal cortex axis, due to centrally-mediated overproduction of corticotrophin releasing hormone [43].
- **Alterations in neuroimaging**: Structural neuroimaging scans in patients with longstanding or untreated depression Show an increased ventricularbrain ratio and other evidence of smaller whole brain parenchymal volume [44], in addition to smaller hippocampal volume [45].

Management: this includes:

1- **Assessment**: social circumstances, comorbid diseases, symptoms severity, risk of suicide, and need for hospitalization needed to be assessed [46].
2- **Patient education**: about the diagnosis, emotional and physical symptoms that could occur, applied therapy, and consequences with or without therapy [47].
3- **Psychtherapy**: can, be considered for patients with mild to moderate major depression. Two major psychotherapies have demonstrated effectiveness in the treatment of major depression in rheurnatological patients: cognitive behavioral therapy (CBT), which deals with relations among affect, behaviour, and cogrution, and interpersonal therapy (IPT), which deals with interpersonal, relationships[48]. The efficacy was 46 and 52 percent, respectively, In major depression [49].
4- **Antidepressants**: selective serotonin reuptake inhibitors (SSRIs) are first line treatment for depression in rheumatological patients because of their safety record and tolerability [48]. Antidepressants are associated with a 50 to 60 percent response rate in major depression (SO). Psychostimulants (for example, tnethylphenidate (Ritalin), 5-20 mg, and dextroamphetamine (Dexedrine), 2.5-10 mg, can be dramatically helpful in the treatment of depression in elderly, medically ill populations, with rapid improvement of mood symptoms in up to half of patients [48].

Relapse is relatively common once patients with major depression stop antidepressant drug therapy [51].

Prognosis and outcomes: The average length of depression is about 6 months, but in about 25% of patient my stay for a year, and about 10-20% may develop chronic and remitting course. Recurrent episodes are reported in 80% of patients with major depression [29]. Depression is powerfully associated with poor outcomes in a variety of health-related quality of life domains, including functional status and self-rated health [52]. Depressive symptoms and syndromes are second only to cardiovascular disorders as the leading health correlates of functional disability [53].

Association of Depression and Rheumatoid Arthritis

Researches have characterized emotions as fluctuating mood state. Both positive (e.g. joy, contentment, interest, and love) and negative (e.g. fear, anger, disgust, and shame) emotions have been shown to influence adaptations among patients with rheumatic disease [3, 54]. Increased negative affect has been linked with increase pain, and also has been associated with greater sensitization to pain [4]. Negative affect has also been linked to stress directly [55]. This suggests that negative affect may be both a part of the experience of pain itself, as well as, a response to stress in pain patients. Conversely, positive affect may actually decrease the vulnerability to stress in rheumatic patients [3].

One of' the most frequently researched of affective disorders in rheumatic disease patients is 'depression.' Depression reflects a combination of negative emotions such as sadness, loneliness, and guilt, typically accompanied by negative cognition about the self, world, and future, and often associated with behavioral apathy (i.e., a lack of motivation and interest) (56). The prevalence of depression in RA patients lies in the region of 13-20% [57, 58, 59, 60, 61]. Thus, RA patients are twice as likely to suffer from depression as members of the general population [59, 62], and they have similar rates of depression when compared with those with other chronic medical illnesses [63, 64]. Depression adversely impacts the outcomes of comorbid diseases (6). Studies have demonstrated associations between depression and pain severity in those patients (65). Depression and stresses were associated with inflammatory markers in rheumatic patients, suggesting that these factors also increase disease activity [66]. Therefore, depression appears to be a key vulnerability factor for increase pain 811d inflammation in patients with rheumatic disease during time of stress. This vulnerability appears to extend beyond current depression, as recent studies have shown that RA patients with a history of depression suffer from more episodes of daily pain [67]. Patients with depression, including depressed RA patients, may feel unsupported by others. In some cases, this perceived lack of support reflects reality, as many individuals find it difficult to spend time with someone w110 is depressed [68]. Depressive symptoms are important and independent contributor to poor health outcome

in rheumatic patients [69]. Furthermore, Depression increases the risk of mortality in RA (hazard ratio (HR)= 1.35, P < 0.0001) [59,70].

The patient's level of depressive feeling was linearly related to the level of functional ability [8]. Addressing the functional limitations experienced by individuals with arthritis is important in managing depression. Conversely, treating depression may also reduce functional limitations [71]. Psychological intervention produced significant reductions in patients' pain behavior and disease activity at post-treatment [72].

REVIEW OF LITERATURE

Many studies about depression in rheumatoid arthritis patients had done before, with few of them found in tile Middle East, and Iraq. The prevalence of depression in RA patients was estimated to be between 13-200/0 in many studies [57,58, 59, 60, 61], but some studies showed more rates and as demonstrated in table (1):

Table (1)

Year	Country	Author	Reference No.	Prevalence of depression in RA patients (%)
1992	Iraq	Hummadi GA	73	38.0
2001	Egypt	El-Miedany, et al	74	66.2
2003	United states	Bartlett SJ	75	30.0
2003	United kingdom	Dickens C, et al	76	39.2 For women with RA
2006	turkey	Isik A, et al	77	41.5

One study had shown that 11 % of RA patients were scored as having moderately severe to severe symptoms of depression [78]; Other studies done showed that depression is twice as common in women with RA as in men [79, 80], with rates highest in the 25-44-year-old age group (in both men and women) [79, 81]. The RA disease duration was positively correlated with the degree of depression [77]. Ang, et al, had found that there was no difference in terms of age, sex distribution, and disease duration between depressed and non-depressed RA groups, and the depressed RA group was significantly more likely to be non-Caucasian; and less likely to be married and to have completed high school [59]. Depression increased with decreasing functional ability, increasing pain, and exposure to such work characteristics as low autonomy, low income, and high demands [82]. Compared to non-depressed patients, the depressed group was significantly more likely to belong to a lower social class [76]. A study logistic regression showed that the optimal predictors of depression in RA were average daily stressors, confidence in one's ability to cope, and degree of physical disability [83].

RATIONALE

The importance of this study lies in the importance of the assessment of the prevalence of depression in RA patients due to the significant burden of depression on them, and the fact that treating depression will facilitate their adaptation to the RA [71, 72].

AIM

1. Find out the point prevalence of major depression among patients with rheumatoid arthritis in Mosul city.
2. Make an analysis to deduce the most effective socio-demographic and rheumatoid arthritis related factors in development of major depression in those patients.

METHOD

Design: this study is descriptive analytic cross sectional study.

Sitting: study was done in Rheumatology outpatient unit in Ibn Sina Teaching Hospital in Mosul city, from 1st July to 31st December, 2008.

Sample and data collection: 200 respondents (male=62, female=138) consisted of randomly selected diagnosed rheumatoid arthritis patients who Visit Rheumatology outpatient unit in Ibn Sina Teaching Hospital in Mosul city and were diagnosed by rheumatologist in this unit both clinically, by the Revised 1987 American Rheumatism Association (Appendix 1), and serologically, and denied having a history of any previous psychological illnesses or psychiatric consultations prior to getting the RA disease. They were chosen randomly by sitting in the rheumatology outpatient examining room and inviting the respondent to take part in the research, and the interview was done in separated room. After finishing the interview, the researcher got back to the examining room and invited the first one who fit to the inclusion criteria of the study.

Ethical Issues: Consents were taken from the headquarter of Ibn Sina Teaching Hospital and from chairman of Rheumatology Unit to perform this study, and verbal consent was taken from "each respondent before establishing the individual interview.

Statistical analysis: the results were subjectedto statistical analysis by using Chi-square test or Fisher exact test. A multiple stepwise backward logistic regression analysis was used to make a-model for predictors of depression in rheumatoid arthritis patients. The computerized statistical program used was STATISTICA version 5.

Instrument: Each respondent was interviewed alone, and after taking socio- demographic data and data related to the rheumatoid arthritis disease (Appendix 4) each had to. undergo. to "Mini International Neuropsychiatric ¬Interview" (M.I.N.I.), Arabic Version 5.0.0 (Module A), concerned in diagnosis of major depressive episodes currently in respect to both DSM- IV and ICD-I o. (Appendix 5) (*)

The M.I.N.I. is a fully structured instrument that was designed a~ a brief structured interview for the major Axis psychiatric disorders in DSM-IV and ICD-IO. Validation and reliability studies comparing the M.I.N.I. to the SCID-P for DSM-III-R and the CIDI showed that it has acceptably high validation and reliability scores (84), with advantages of:

1. Relatively brief training needed for its Use
2. Quick administration time
3. Inexpensive
4. Suitable for use in the research sitting

The M.I.N.I. Plus is divided into modules identified by letters; each corresponds to a diagnostic category. At the end of each module, diagnostic box (es) permits the clinician to indicate whether diagnostic criteria are met. All questions must be rated by circling either Yes or No. Clinical judgment by the rater should be used in coding the responses [(85)].

Diagnosis of major depression is established if all of the followings are met (*):
• 'Yes' answer for either Al or A2 questions or both.
• 'Yes' answer for 3 or more questions of A3 group (or 4, if either Al or A2 question is answered 'No').

Inclusion criteria: patients of both sexes, ranging from 18-75-year-old, with confirmed diagnosis of rheumatoid arthritis (clinically and serologically), and without history of depression prior to RA.

Exclusion criteria: any respondent with RA that is not confirmed by serological tests, or having history of depression prior to having RA disease.

No one, of the invited respondents refused to take part in the research or to continue the interview after it had been started.

The current prevalence or major depression in RA patients found to be 29.0% (male 35.5%, female 26.1 %). Relationship between the development of major depression in RA patients and the effect of gender, employment, income, and duration of illness has shown statistically non-significant difference. While the effects of other factors are shown in the tables (2-9):

Table (2) shows the distribution of the respondents with rheumatoid arthritis according to sociodemographic and disease related characteristics, and it shows that 138 (69%) respondents were females, 141 (70%) were Arabs, no Yezidis or other ethnic groups are seen, 126 (63%) were married, 148 (74%) were non-employed -including 111 (55.5%) housewives, 133 (66.5%) had not-enough income, and 109 (54.5%) have severe RA disease.

Table 2. Distribution of respondents with rheumatoid arthritis according to sociodemographic and disease related characteristics.

Characteristic		RA patient (n=200)	
		No.	%
Gender	Male	62	31.0
	Female	138	69.0
Ethnicity	Arabs	141	70.5
	Kurds	36	18.0
	Kuloashors	12	6.0
	Shabaks	11	5.5
Age (year)	18-39	42	21.0
	40-59	92	46.0

Characteristic		RA patient (n=200)	
		No.	%
	60-75	66	33.0
Marital status	Single	32	16.0
	Married	126	63.0
	Widow	30	15.0
	Divorced	12	6.0
Employment	Non-employed	148	74.0
	Retired	28	14.0
	Private	6	3.0
	Gov. employee	18	9.0
income	Not-enough	133	66.5
	Enough	67	33.5

Table (3) shows the distribution of the respondents with rheumatoid arthritis according to RA-related characteristics.

Table 3. The distribution of the respondents with rheumatoid arthritis according to RA-related characteristics.

RA-related characteristic		RA patient (n=200)	
		No.	%
Duration of disease (yr)	1-5	72	36.0
	6-10	47	23.5
	≥11	81	40.5
Severity	Mild	16	8.0
	Moderate	75	37.5
	Severe	109	54.4

Table (4) shows the symptoms profile of major depression in patients with rheumatoid arthritis plus major depression. It shows that 100% have depressed mood, and about third have thoughts of death or suicide.

Table 4. Symptoms profile of major depression in patients with rheumatoid arthritis plus major depression.

Symptoms	Patient with rheumatoid arthritis plus depression (n=58) Symptoms	
	No.	%
Depressed mood	58	100.0
Loss of interest	52	89.7
Weight disturbance	49	84.5
Sleep disturbance	44	75.9
Fatigue, loss of energy	35	60.3
Feeling of guilt or worthlessness	24	41.4
poor concentration	21	36.2
psychomotor agitation or retardation	20	34.5
Thought of death or suicide	19	32.8

Table (5) shows the distribution of rheumatoid arthritis patients according to gender and depression and it shows no statistically significant difference between males and females.

Table 5. Distribution of rheumatoid arthritis patients according to gender and depression.

Gender	Arthiritis + depression (n=58)		Arthristis only (n=142)		Or	95% c.I.	p-value
	No.	%	No.	%			
Male	36	62.1	102	71.8	0.642	0.34-1.22	0.176(NS)
female	22	37.9	40	28.2			

NS = Not significant using Chi-square test

Table (6) shows the distribution of rheumatoid arthritis patients according to ethnicity and depression and it shows a highly statistically significant difference.

Table 6. Distribution of rheumatoid arthritis patients according to ethnicity and depression.

ethnisity	Arthiritis + depression (n=58)		Arthristis only (n=142)		p-value
	No.	%	No.	%	
Arabs	44	75.9	97	68.3	0.003
Kurds	11	19.0	25	17.6	
Kuldoashors	2	3.4	10	7.0	
shabaks	1	1.7	10	7.0	

NS = Not significant using fisher freeman halton test

Table (7) shows the Distribution of rheumatoid arthritis patients according to age and depression, and it shows that younger age group (≤39) have the lowest prevalence of major depression, and that the middle age group (40-59) shows a statistically significant difference from the younger age group.

Table 7. Distribution of rheumatoid arthritis patients according to age and depression.

Age (year)	Arthritis + depression (n=58)		Arthristis only (n=142)		Or	95% c.I.	p-value
	No.	%	No.	%			
18-39	7	12.1	35	24.6	1	-	-
40-59	31	53.4	61	43.0	2.54	1.01-6.37	0.043
60-75	20	34.5	46	32.4	2.17	0.83-5.72	0.112(NS)

NS = Not significant using Chi-square test

Table (8) shows the distribution of rheumatoid arthritis patients according to marital status and depression, and it shows that the married group has the least prevalence of major depression, and that widow group shows a very highly statistically significant difference.

Table 8. Distribution of rheumatoid arthritis patients according to marital status and depression.

Age (year)	Arthritis + depression (n=58)		Arthritis only (n=142)		Or	95% c.I.	p-value
	No.	%	No.	%			
Single	10	17.2	22	15.5	1.75	0.74-4.14	0.203(NS)
Married	26	44.8	100	70.4	1	-	-
Widow	17	29.3	13	9.2	5.03	2.17-11.66	<0.001
divorced	5	8.6	7	4.9	2.75	0.81-9.36	0.097(NS)

NS = Not significant using Chi-square test

Table (9) shows the multiple stepwise backward logistic regression model for predictors of depression in rheumatoid arthritis patients, and it shows that the risk factors for development of major depression in patients with RA are being Single, Widow or Divorced, as well as having a severe mode of RA. On the other hand, the protective factors against the development of major depression in such patients are being employed.

Table 9. Multiple stepwise backward logistic regression model for predictors of depression in rheumatoid arthritis patients.

Variable Xi (predictors)	Regression coefficient (B)		95% c.I.	p-value
Marital status	0.662	1.939	1.38-2.72	<0.001
Employment	-0.501	0.606	0.36-1.02	0.05
Severity	0.887	2.43	1.32-4.48	0.005

Dependent Variable: Depression

Distribution of rheumatoid arthritis patients according to age, employment, income, duration, and severity of the disease in regards to depression were analyzed, and found to have no statistically significant differences.

For the whole data, percentages were calculated, and Chi-square or Fisher exact test were performed to determine whether the data have statistical significance whenever applicable.

LIMITATIONS

1. The violence, terrorism and military operations in Mosul city restricted the attendance of most of the rheumatological patients to the rheumatic clinic in the general hospital.
2. The duration suggested for the research was too short to conduct such study.

DISCUSSION

The present study shows:

Prevalence of major depression in RA patients found to be 29.0% (males 35.5%, females 26.1%), which is more than that in studies done elsewhere 13- 20% [57, 58, 59, 60, 61], and this is may be due to the difficult situation in Mosul city in regard to security, political, social, and economical aspects. But is similar to Bartlett study in USA -30% [75], and less than other studies shown in the 'review of literature' - 38.0-66.20/0 [73, 74, 76, 77].

About third (32.8%) had reported thoughts of death or suicide, (Table 3) and this figure is much less than that reported in studies done elsewhere, i.e. about two thirds of all depressed patients contemplate suicide [86]. This may be due to the religious principles that predominate in the local society which forbidden suicide. Studies done elsewhere had showed that committing suicide is of much risk in single, divorced and widow persons [87], as well as patients with chronic illnesses [86], such as RA in this study. Logistic regression in this study showed that all above situations are found to be risk factors in development of major depression in RA patients.

Analyzing the effect of gender factor showed no statistically significant difference between prevalence of major depression in males (35.5%) and females (26.1 %) with RA (Table 4), and this is similar to the result in Ang, et a1. study [59]. But here it showed that male gender is risky, and this is not the case in studies done elsewhere which showed female gender to be the risk factor [79, 80]. but this may be explained here by the fact that exposure to daily stressors is an optimal "risk factor for the development of major depression in RA patients [83], and in area of this study men are exposed to much stress than women due to the problematic security situation, and males, also, are responsible for the financial aspect of life in their families, and RA might cause limitations in work ability that adds more stress on males. analyzing the effect of ethnicity factor (Table 5) showed a highly statistically Significant difference (p=0.003) between ethnic groups, and this is due to the higher rates of major depression in Arabs (31.2%) and Kurds (30.60/0) as compared to the lower rates in Kuldoashors (16.7%) and Shabaks (9.1%). This statistical significance may be due to the low numbers of the respondents in the last two ethnic groups-12 and 11 respectively, in contrast to the much higher number for those in the first two groups -141 and 36 respectively, and may be due to the fact that both Kuldoashors and Shabaks are living in areas inside a d outside Mosul city that are more secure than areas that both Arabs and kurds are lived in. Ang, et al. study in USA had shown significant difference between ethnic groups too [59].

Analysis of the effect of age (Table 6) showed that the (40-59 yr) group had a statistically significant difference (p=0.043) , as a risky factor , and that much older group (60-75 yr) had a statistically non-significant difference ,but still a risky factor too, on development of major depression in RA patients as compared to the younger age group (18-39 yr), This is not the case in studies done elsewhere which showed that the younger age groups are more prone to develop depressive symptoms in RA patients [79, 81]. Although, Ang, et al. study had shown 110 significant difference among age groups [59]. But we should remember her that the peak onset for major depression is in the fourth decade of life [88], and that the older patients usually have the more severe forms of the RA disease that could make some suffer from limited physical ability or being crippled [1].

Analysis of the effect of marital status (Table 7) showed that being a widow had a very highly statistically significant difference (<0.001) as compared to the married group as a risk factor in development of major depression in RA patients. Being single or divorced are also risk factors but with no statistically significant difference as compared to married group. There are no similar studies found in this field to compare with, but other studies showed that the absence of a marital partner may hasten the onset of depression among vulnerable individuals [86, 89], including RA patients [59, 62].

Multiple stepwise backward logistic regression model for predictors of depression in RA patients (Table 8) showed that the risk factors for development of major depression in patients with RA are being Widow, Divorced or Single, and this had been explained above, as well as, having a more severe form of RA is another important risk factor as increased severity indicates more deterioration in physical ability [1, 90], and this is considered as a risk factor for development of depression in RA patients [82, 83]. On the other hand, the protective factors against the development of major depression in RA patients are being employed. Studies done elsewhere had shown that being unemployed is a risk factors for development of depression in RA patients [86, 91].

Relationship between the development of major depression in RA patients and the effect of income has shown statistically non-significant difference. Fifield, et al. study had shown that having a low income is a risk factor for development of depression in RA patients [82].

Relationship between the development of major depression in RA patients and the effect of duration of illness has shown statistically non-significant difference. Ang, et a1. study had shown the same result [59], but Isik, et al. study had shown that RA disease duration was positively correlated with the degree of depression [77].

CONCLUSIONS

This study had revealed tile followings:

- the prevalence of major depression in RA patients visiting the Rheumatology unit at Ibn Sina Teaching Hospital was 29.0% (male 35.5, female 26.1), and this is more tile prevalence of depression in general population (4-6 %) (33), or in RA patients in studies done elsewhere (13¬20%) [57-61].
- There was a statistically significant difference between ethnic groups in Mosul city in regard to the prevalence of major depression in RA patients.
- Higher age groups (≥40 yr) have a higher risk to develop major depression in RA patients.
- Being single, widow or divorced are risk factors for developing major depression in RA patients.
- Having a severe form of RA is a risk factor for developing major depression in RA patients.
- Being employed is a protective factor against the development of major depression in RA patients.
- Relationship between the development of major depression in RA patients and the effect of gender, employment, income, and duration of illness has shown statistically non-significant difference.

SUGGESTIONS AND RECOMMENDATIONS

- Performing more detailed researches about the prevalence and the risk factors for mental illnesses in rheumatic patients.
- Advice to do an assessment of tile psychological condition in patients visiting the rheumatology units to reveal any mental disorder that may affect the prognosis of the rheumatic disease and the compliance to treatment, and to decrease tile severity of pain which worsen by mental adversities.
- Training of rheumatologist to do initial psychiatric interview, revealing mental illnesses, and treating mild, cases, and advised to send for psychiatrist consultation for the more severe or untreatable mild cases.

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APPENDIX 1

American Rheumatism Association revised criteria for rheumatoid arthritis classification

	Criterion	Description
1.	Morning stiffness	Morning stiffness in and around the joints, lasting at least one hour before maximal improvement.
2.	Arthritis of 3 or more joint areas	At least 3 joint areas (out of 14 possible areas; right or left PIP, Mcp, wrist, elbow, knee, ankle, MTP joints) simultaneously have had soft- tissue swelling or fluid (not bony overgrowth alone) as observed by a physician
3.	Arthritis of hand joints	At least one area swollen (as defined above) wrist, MCP, or PIP joint.
4.	Symmetric arthritis	Simultaneous involvement of the same joint areas (as defined above) on both sides of the body (bilateral involvement of PIPs, MCPs, or MTPs, without absolute symmetry is acceptable).
5.	Rheumatoid nodule	Subcutaneous nodules over bony prominences or extensor surfaces, or in juxta-articular regions as observed by a physician.
6.	Serum rheumatoid factor	Demonstration of abnormal amounts of serum rheumatoid factor by any method for which the result has been positive in less than 5% of normal control subjects.
7.	Radiographic changes	Radiographic changes typical of rheumatoid arthritis on posteroanterior hand or wrist radiographs, which must include erosions or unequivocal bony decalcification localized in, or most marked adjacent to, the involved joints (osteoarthritis changes alone do not qualify).

Note: For classification purposes, a patient has RA if at least four of these criteria are satisfied (the first four must have been present for at least six weeks).

APPENDIX 2

Classification of Progression of Rheumatoid Arthritis (90)

Stage I, Early

* 1. No destructive changes on roentgenographic examination

* 2. Radiographic evidence of osteoporosis may be present

Stage II, Moderate

* 1. Radiographic evidence of osteoporosis, with or without slight subchondral bone destruction; slight cartilage destruction may be present.

* 2. No joint deformities, although limitation of joint mobility may be present

3 Adjacent muscle atrophy

4 Extra articular soft tissue lesions, such as nodule and tenosynovitis may be present.

Stage III, Severe

* 1. RadiographiC evidence of cartilage and bone destruction, in addition to osteoporosis.

* 2. Joint deformity, such as subluxation, ulnar deviation, or hyperextension, without fibrous or bony ankylosis.

3.Extensive muscle atrophy.

4.Extra-articular soft tissue lesions, such as nodules and tenosynovitis may be present.

Stage IV, Terminal

* 1. Fibrous or bony ankylosis

2. Criteria of stage III.

* The criteria prefaced by (*) are those that must be present to permit classification of a patient in any particular stage or grade.

APPENDIX 3

DSM-IV Criteria for Diagnosis of Major Depression Episode (25)

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. **Note**: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

1.Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). **Note**: In children and adolescents, can be irritable mood.

2.markedly diminished interest or pleasure in all, or almost ali, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others).

3.significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. **Note**: In children, consider failure to make expected weight gains.

4.insomnia or hypersomnia nearly every day.

5.psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).

6.fatigue or loss of energy nearly every day.

7.feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).

8.diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)

9.recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan committing suicide.

B. The symptoms do not meet criteria for a mixed episode.

C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

E. The symptoms are not better accounted for by bereavement, l.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

ABBREVIATIONS

C.I.: confidence intrerval

DMARD: Disease -modifying antirheumatic drugs

DSM- IV: Diagnostic and statistical manual of mental disorders (4th edn).

EBV: Epstein-Barr virus

ICD-10: International statistical classification of diseases and related health problems, 10th revision.

MAO: monoamine oxidase

MCP: metacarbophalengeal joints·

M.I.N.I.: Mini International Neuropsychiatric Interview

MTP: metatarsophalengeal joints

NSAIDs: Non-steroidal anti-inflammatory drugs
OR: odd ratio
PIP: proximal interphalangial joints
RA: rheumatoid arthritis
SSRls: selective serotonin reuptake inhibitors
USA: United States of America

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