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Original Research Article

Assessment of Quality of Life of Patients Suffering from Osteoporosis and Arthritis

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ABSTRACT

Osteoporosis and arthritis are widespread diseases; an evaluation of quality of life could help to develop more effective preventive and therapeutic measures for osteoporosis and arthritis. Therefore, the objectives of this study was to assess the degree of pain, frequency of consumption of calcium and phosphorus rich foods and quality of life of the patients suffering from osteoporosis and arthritis. The study was carried out to assess quality of life of 75 respondents aged 30-60 years (25 each in the category of osteoporosis, arthritis and normal control group). Data were collected on anthropometric measurements, frequency of food consumption, pain assessment and quality of life using standard tool & techniques. Results indicated that no significant difference was found between the mean score of BMI in all three groups (patients of osteoporosis, patients of arthritis and normal control group). Many pain sites were found in patients which were related to poor quality of life. Daily consumption of calcium and phosphorus rich food was lower in osteoporosis and arthritis patients as compared to normal control group. Patients suffering from osteoporosis and arthritis scored significantly lower on all domains of SF-36 than normal control group. Scores of all domains were below 50% in patients which indicated poor quality of life. No significant correlation was found between pain and age of patients suffering from arthritis. Study concluded that quality of life of patients suffering from osteoporosis and arthritis was much poor as compared to normal control group.

Key words: Quality of Life, Osteoporosis, Arthritis, Health related quality of life (HRQOL), SF-36

INTRODUCTION

Osteoporosis and arthritis are diseases inflicting skeletal fragility because of low bone mass and changes in bone structure, and ends up in fracture from low impact, increases with the age of the patients. [1] Osteoporotic fractures in India occur remarkably in each sexes and major reason for mortality and morbidity in aged. In 2009 IOF Asian Audit, expert group estimated that in 2003 six million people was osteoporotic, that was increased up to thirty six million in 2013. [2] Arthritis also affects one in four adults. [3] There are more than 100 types of arthritis. The problem of arthritis is also prevalent, 22.7 percent patients were found with arthritis from 2010 to 2012. [4] Osteoporosis and arthritis are painful, degenerative bone or joint diseases and these can result in loss of height, severe back pain, and change in one's posture. Usually, the first symptom of these diseases is mainly pain. Daily pain, stiffness, fatigue, and physical disability, reduced social activity, poor well-being and depressed mood. These problems, and the way patients cope with them, can affect their quality of life. Osteoporosis and arthritis are traditionally considered to be a disease with a major impact on all aspects of quality of life. Since osteoporosis and arthritis are widespread disease, an

evaluation of quality of life including social, emotional and physical functioning could help to develop more effective preventive and therapeutic measures for osteoporosis and arthritis. Osteoporosis and arthritis has numerous medical implications and a huge economic impact. So it is of utmost importance that we take immediate steps to create awareness and treatment of this disease. Assessing health related quality of life and using this as an outcome measure is becoming increasingly important in health services research and in clinical trials. [5]

Quality of life is related to both self-reported chronic diseases (diabetes, breast cancer, arthritis, and hypertension), and their risk factors (body mass index, physical inactivity, and smoking status). Measures of Health-related quality of life (HRQOL) have gained increasing attention as relevant outcomes in clinical studies. [6-7] These measures are also used in epidemiological surveys, complimentary to data on morbidity and health care utilization, to estimate the burden of disease and often to compare with other chronic diseases. [8]

MATERIALS AND METHODS

The study was undertaken at Goyal Hospital (Shashtri Nagar, Jaipur) catering to the orthopaedic patients, with a view to study the nutritional status and quality of life of patients suffering from osteoporosis and arthritis. Seventy five respondents in the age group of 30-60 years were selected purposively in to three groups: 25 patients suffering from osteoporosis, 25 patients suffering from arthritis and 25 respondents in normal control group. The data was collected through face to face interview technique.

2.1 Anthropometric measurement: Height was recorded using anthropometric board. Weight was recorded using bathroom weighing scale. BMI was calculated by using following formula. [9]

$$\text{Body Mass Index} = \frac{\text{Weight (Kg)}}{\text{Height (m}^2\text{)}}$$

2.2 Pain assessment: Pain was assessed by modified pain assessment tool in which some variables were recorded such as location the area where they feels pain, whether pain is constant or not, onset of pain, duration of pain, the time and duration when the pain is worst, what relieves pain and what cause the increase in pain. [10]

2.3 Dietary information: Self prepared Qualitative food frequency questionnaire was used to assess consumption pattern of foods rich in calcium and phosphorus.

2.4 Quality of life: The Medical Outcomes Study 36-item Short-Form Health Survey (SF-36), [11] is a popular tool for assessing health related quality of life (HRQOL) and has been used in many physical health conditions and healthcare settings. [12-13]

Statistical Analysis:

The data were compiled and statistically analysed using mean, standard deviation and percentage for univariate parameters. ANOVA was used to find out significant difference between various parameters among experimental and control groups. Association between pain and quality of life was assessed using Karl Pearson's coefficient of correlation method. Associations were considered statistically significant at $P<0.05$ level. [14]

RESULTS AND DISCUSSION

The present study was designed to assess the quality of life of 75 respondents (25 patients suffering from osteoporosis, 25 from arthritis and 25 healthy control) aged 30-60.

Table 1: Frequency distribution of subjects according to age

Age in years	Patients suffering from Osteoporosis		Patients suffering from Arthritis		Normal control subject	
	Frequency (N= 25)	%	Frequency (N= 25)	%	Frequency (N= 25)	%
30-40	2	8	8	32	14	66
40-50	11	44	9	36	11	44
50-60	12	48	8	32	-	-

Among patients of above 40 years of age, the osteoporosis patients were 92%, arthritis patient were 68% whereas normal control subjects were only 44%. This indicated that osteoporosis and arthritis are more common in patients aging more than 40 years (Table 1).

3.1 Anthropometric measurement

To study the impact of diseases such as osteoporosis and arthritis, care was taken while selecting respondents.

Table 2: Mean anthropometric measurements of subjects

Anthrop-ometric variables	Patients suffering from Osteoporosis		Patients suffering from Arthritis		Normal control subjects		F score	Level of significant at 5%
	Mean	±SD	Mean	±SD	Mean	±SD		
Height (cm)	161.24	±6	161.91	±5.73	161.48	±5.52	0.0070	$F<F_{0.5}$ NS
Weight (Kg)	63.76	±6.21	64.60	±5.5	62.28	±5.3	0.0819	$F<F_{0.5}$ NS
BMI	24.71	±2.84	24.79	±2.53	24.06	±2.28	0.048	$F<F_{0.5}$ NS

Table 3: Frequency distribution of subjects according to BMI

BMI category*	Patients suffering from Osteoporosis		Patients suffering from Arthritis		Normal control subjects	
	Frequency (N= 25)	%	Frequency (N= 25)	%	Frequency (N= 25)	%
Normal (18.50-22.99)	5	20	8	32	9	36
Overweight (23-24.99)	10	40	6	24	8	32
Pre obese (25-29.99)	9	36	9	36	8	32
Obese >30	1	4	2	8	-	-

*Calculated by WHO BMI for Asian population, 2004 [15]

The results also revealed that the mean height, weight and BMI of respondents in all the three groups i.e. patients suffering from osteoporosis, patients suffering from arthritis and normal control group were similar and statistically there was no significant difference (Table 2).

Patient suffering from osteoporosis and arthritis were more in pre-obese category as compare to normal control group while maximum number of control group was in normal category of BMI (Table 3). In the osteoporosis group 80% patients and in arthritis group 68% patients had BMI more than 23 which was indicated as overweight, preobese and obese while in normal control group were either 64% overweight or obese.

Table 4: Pain assessment

Pain	Patients suffering from osteoporosis	Patients suffering from arthritis
Location of pain		
Knee and ankle	52%	40%
Back and shoulder	20%	36%
Waist and elbow	28%	24%
Duration of pain		
Past 5 year	35%	-
Past 3 year	52%	48%
Past 1 year	20%	52%
Time when pain worst		
Any time of the day	48%	52%
Morning	4%	4%
Evening	28%	32%
Night	20%	12%
Causes in increasing pain		
Regular work and stress	28%	48%
Walking	28%	12%
By consuming acidic food	12%	-
In winter	8%	-
Lifting heavy objects	-	8%
Every 2 hours	-	32%

Pain assessment

Pain assessment was done by asking the question related to different sites of pain, duration of pain, time when pain was worst and causes of pain.

Many pain sites were found in both groups. In osteoporosis patients the pain was found mainly at knee and ankle, waist and elbow. Arthritis patients reported that the main site of the pain knee and ankle, back and shoulder. The duration of pain in osteoporosis ranged from 1-5 year, whereas it was 1-3 years in arthritis patients. Most of the patient reported their pain was worst at any time of the day, while some patients

reported that the pain was worst in the morning than in evening and night. Regular work and stress was the main cause for increasing the pain in patients of arthritis, followed by walking and lifting heavy objects. In osteoporosis patients, regular work, stress and walking were the cause of pain followed by consuming acidic foods (Table 4).

3.3 Frequency of food consumption

Daily consumption of calcium and phosphorus rich foods such as milk and milk products was lower in patients of both groups as compared to normal control group. The intake of protein foods, nuts and oil seeds such as almond and till was also lower in osteoporosis and arthritis patients, where as it was normal in control group. The intake of coconut was also low in patients. Seasonal Green leafy vegetables consumptions in patients were also low.

3.4 Quality of life

The quantitative analysis of SF-36 domain scores showed substantial differences in all three examined group.

Table 5: Distribution of subjects according to various domains of quality of life

Components of quality of life	Patients suffering from osteoporosis		Patients suffering from Arthritis		Normal control group		f score	Level of significant at 5%
	Average	SD	Average	SD	Average	SD		
Physical Functioning	24.8	11.53	23.4	10.46	61.6	5.95	10.13	$F>F_{0.5}$ Significant
Role Physical	16.8	19.59	9.2	11.37	100	0	29.67	$F>F_{0.5}$ Significant
Role Emotional	14.65	21.23	4	10.82	100	0	29.26	$F>F_{0.5}$ Significant
Social Functioning	31.6	13.98	35	20	82.5	14.58	6.01	$F>F_{0.5}$ Significant
Bodily Pain	25	7.71	26.32	19.15	89.7	9.73	10.58	$F>F_{0.5}$ Significant
Mental Health	34.56	16.39	32.37	17.19	81.28	2.71	8.01	$F>F_{0.5}$ Significant
Vitality	23.44	20.02	23.4	14.75	76.88	7.93	8.39	$F>F_{0.5}$ Significant
General Health perception	46.64	8.97	39.5	8	58.62	4.85	3.33	$F>F_{0.5}$ Significant
Total	39.80	11.51	40.79	11.16	78.19	5.28	13.17	$F>F_{0.5}$ Significant

The scores for all domains were considerably lower in both disease (osteoporosis and arthritis) groups than in control group and the differences were statistically significant at the 5% level.

All items of the SF-36 in patients suffering from osteoporosis and arthritis had significantly lower scores (less than 50%) on all dimensions than normal control group. The mean scores for all domains of patients were less than 50% indicating poor quality of life.

The scores of all domains for respondents in normal control group were above 50, indicating good health, which was less than 50% in patients suffering from arthritis and osteoporosis.

The mean scores on domain physical functioning, role physical, role emotional, mental health and general health perception was least in patients suffering from arthritis in comparison to osteoporosis and normal control group. The social functioning and bodily pain was found poor in patients of osteoporosis in comparison to arthritis and normal control group. Score of vitality was found similar in osteoporosis and arthritis patients, but was lower than normal control group.

The mean summation scores of SF-36 of patients suffering from osteoporosis and patients suffering from arthritis were similar (39.80±11.51 and 40.79±11.16, respectively). These scores were much lower than normal control group (78.19±5.28) (Table 5).

No significant differences was found between patients of osteoporosis and patients of arthritis group concerning all the domains, except for the role emotional, which was found to be superior in the patients suffering from osteoporosis.

Physical activities such as walking, climbing, bending, lifting, and moderate and vigorous activities were limited due to lower physical functioning. Lower role physical and role emotional scores indicate that physical and mental health interferes with work or other daily activities. Bodily pain showed the intensity of pain and effect of pain on normal work. Lower vitality scores indicated that patients were not feeling energetic and they were easily tired and worn out (Table 6).

Table 6: Critical differences between patients of osteoporosis, patients of arthritis and normal control group

Components of Quality of Life	AVsC	BVsC	AVsB
Physical Functioning	15.59*	13.93*	0.433 NS
Role Physical	39.3*	21*	1.64 NS
Role Emotional	44.03*	19.44*	2.19*
Social Functioning	9.48*	12.47*	0.68 NS
Bodily Pain	14.6*	15.85*	0.25 NS
Mental Health	13.89*	13.9*	0.45 NS
Vitality	15.82*	12.25*	0.007 NS
General Health perception	8.52*	5.81*	0.58 NS
BMI	0.89 NS	1.07 NS	0.10 NS
Weight	0.89 NS	1.5 NS	0.49 NS
Height	0.14 NS	0.26 NS	0.39 NS

* Denotes at 5% level
A= patients suffering from osteoporosis
B= patients suffering from arthritis
C= normal control group

Correlation was tested in some domains of SF-36 scores. The score of pain was given in the inverse relationship, i.e. the higher score was given for less pain and less score for higher pain. A positive correlation was found between pain and physical functioning in patients suffering from osteoporosis and patients suffering from arthritis (R=0.60, R=0.46, respectively), indicating that if there is less pain the physical activity will be more and vise a versa. Patients suffering from osteoporosis and arthritis had positive correlation between pain and general health perception (R=0.38, R=0.10, respectively), showed that lesser the pain, the perception for general health will be better.

A positive correlation was also found between mental health and general health perception in patients suffering from osteoporosis and arthritis (R=0.33, R=0.03, respectively), revealed that patients with good general health perception, having better mental health.

Table 7: Physical and mental component summery

summery	Osteoporosis	Arthritis	Normal
Physical component	28.3±14.45	24.6±11.70	77.48±5.13
Mental component	26.1±17.9	23.6±15.6	85.1±6.30

Total score of the physical component of quality of life and mental component of quality of life were found lower in patients suffering from osteoporosis and those from arthritis as compared to normal control group (Table 7).

From the study it is concluded that the mean score of HRQOL in all the domain among patients suffering from osteoporosis and arthritis was significantly lower from normal control group which indicates poor quality of life of patients in disease group. The mean score of physical component and mental component was also found lower in patients. Consequently role limitation due to emotional problem domain was most affected domain. Patient's general health perception was positively correlated to mental health and pain. No significant correlation was found between BMI and pain. Patients feel pain more than one places in the body have poor quality of life. As the number of site of pain increases the quality of life decreases.

CONCLUSION

The present study concluded that patients suffering from osteoporosis and arthritis scored less than 50% in all the domains of health related quality of life, which indicates poor quality of life. The mean scores on all the domain was found significantly lower in patients suffering from either osteoporosis or arthritis when compared to normal control group. Frequency of consumption of calcium and phosphorus rich food was very low in patients when compared to normal control group. It was observed that if the patient report pain on more than one site in the body the quality of life scores reduced.

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