Published in final edited form as:

Clin Rheumatol. 2013 June ; 32(6): 763–769. doi:10.1007/s10067-013-2167-9.

Impact of Managed Care Health Insurance System for Indigent Patients with Rheumatoid Arthritis in Puerto Rico

Yesenia Santiago-Casas, MD¹, Tania González-Rivera, MD², Leslie Castro-Santana, MD¹, Grissel Ríos, MD¹, David Martínez, MD¹, Vanessa Rodríguez, MD¹, Rafael González-Alcover, MD¹, Ángel M. Mayor, MD, MS¹, and Luis M. Vilá, MD¹

¹Division of Rheumatology, Department of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

²Division of Rheumatology, Department of Medicine, University of Michigan School of Medicine, Ann Arbor, Michigan

Abstract

The aim of this study was to determine the clinical outcome among indigent patients with rheumatoid arthritis (RA) in Puerto Rico receiving their healthcare in a managed care system, as compared to non-indigent patients treated in fee-for-service settings. A cross-sectional study was conducted in 214 Puerto Ricans with RA (per American College of Rheumatology classification criteria). Demographic features, health-related behaviors, cumulative clinical manifestations, disease activity (per Disease Activity Score 28), comorbid conditions, functional status (per Health Assessment Questionnaire, HAQ), and pharmacologic profile were determined. Data were examined using univariable and multivariable (logistic regression) analyses. The mean (standard deviation [SD]) age of the study population was 56.6 (13.5) years; 180 (84.1%) were women. The mean (SD) disease duration was 10.8 (9.6) years. Sixty-seven patients were treated in the managed care setting and 147 patients received their healthcare in fee-for-service settings. In the multivariable analyses RA patients treated in the managed care setting had more joint deformities, extra-articular manifestations, arterial hypertension, type 2 diabetes mellitus, cardiovascular events, fibromyalgia syndrome, and poorer functional status, while having a lower exposure to biologic agents than those treated in fee-for-service settings. Efforts should be undertaken to curtail the gap of health disparities among these Hispanic patients in order to improve their long term outcomes.

Key indexing terms

Rheumatoid arthritis; medically-indigent patients; Hispanics; Puerto Ricans; healthcare; managed care system; fee-for-service system

Introduction

Rheumatoid arthritis (RA) is a chronic and disabling autoimmune disease characterized by erosive arthritis that may ultimately have a negative impact in a patient's quality of life. The effect of socioeconomic disadvantage on health outcomes has been well established among the general population. Several studies have shown that populations with low socioeconomic

Address for correspondence and reprint request: Luis M. Vilá, MD, Chief and Program Director, Division of Rheumatology, University of Puerto Rico Medical Sciences Campus, PO Box 365067, San Juan, PR 00936-5067, Telephone: 787-758-2525, ext. 1825, Fax: 787-764-6839, luis.vila2@upr.edu.

Disclosures: The authors have no conflicts of interest to disclose.

status have a greater number of hospitalizations and higher death rates than those with higher socioeconomic status [1, 2]. Data in RA have been consistent with these observations and have shown a significant relationship of socioeconomic deprivation with disease activity and severity, functional status, health outcomes, allocation of medications, and premature mortality [3–6].

Healthcare in Puerto Rico from 1960 through 1994 consisted of a private system and a government-funded public sector financed from a combination of Commonwealth funds and federal Medicaid contributions. Anyone who needed healthcare had access to this public setting essentially without limits, as long as the services requested were available [7]. In 1994, a Healthcare Reform was implemented in Puerto Rico which established a public, managed-care health system for the medically underserved population. Through this health reform insurance companies assumed the financial risks associated with the delivery of the healthcare services, while the role of the health authorities in Puerto Rico shifted from operating healthcare facilities to financing and monitoring the care delivered by private providers [8]. The eligibility for the public health insurance was determined by the annual family income adjusted for the number of individuals in the household. For eligibility purposes this income was defined at or below poverty level according to United States standards. One of the expected benefits of the healthcare reform in Puerto Rico was to improve access and quality of health for the medically indigent population. However, Alegría and colleagues found a minimal impact of managed care on the use of outpatient mental health and substance abuse services in Puerto Rico [7]. Furthermore, Marín and colleagues reported that although an increment in prenatal care utilization was noted after the Puerto Rico Healthcare Reform, these improvements were not sufficient to match the levels of utilization observed for privately insured women [9].

In contrast to the fee-for-service system, the managed-care system seeks medical care cost reductions; these could affect the management and outcome of RA patients. There are no studies exploring the clinical disparities among RA patients in Puerto Rico having different types of health insurance. Thus, the aim of this study was to determine the disease activity, joint damage, comorbidities, functional status and pharmacologic profile in a Puerto Rican population of indigent patients with RA receiving their healthcare through managed care and compare these clinical parameters with those of non-indigent patients treated in fee-for-service settings.

Methods

Patient Population

A cross-sectional study was performed in 214 patients with RA. All patients were ≥ 21 years old, had Puerto Rican ethnicity (self and four grandparents) and fulfilled the 1987 American College of Rheumatology (ACR) classification criteria for RA [10]. Consecutive RA patients evaluated at the Rheumatology clinics of the University of Puerto Rico Medical Sciences Campus in San Juan, Puerto Rico, and three private rheumatology practices located in San Juan, Puerto Rico were included in the study. Patients were enrolled between February 2007 and April 2008. The study was approved by the Institutional Review Board of the University of Puerto Rico Medical Sciences Campus.

RA patients had their routine visits at two-three month intervals. Additional visits were scheduled as necessary by disease activity or complications. At study visit, the physician completed a structured questionnaire to gather information about demographic parameters, health-related behaviors, cumulative clinical manifestations, laboratory tests (complete blood cell count, comprehensive metabolic panel, urine analysis, erythrocyte sedimentation

rate [ESR], lipid panel and autoantibodies such as rheumatoid factor and anti-cyclic citrullinated peptide), pharmacologic treatment, disease activity, and disease damage.

Variables

For the analyses, patients were allocated into two groups based on how they received their healthcare. The patients who were evaluated at the University of Puerto Rico clinics belonged to the “public group” (managed care setting) and those who received their care at the private rheumatology practices, comprised the “private group” (fee-for-service setting). None of the patients studied in the private settings had health insurance based on managed care.

The following demographic features were examined: age, gender, and disease duration. Age at diagnosis was defined as age at which the patient met the ACR criteria for RA. Disease duration was defined as the time interval between RA diagnosis and study visit. Health-related behaviors including cigarette smoking, alcohol consumption and exercise were also evaluated. The latter was defined as regular participation in physical activity as part of a personal fitness plan.

The cumulative RA manifestations and comorbid diseases were determined at study visit. RA manifestations including joint deformities/contractures (defined as loss of more than 20% of range of motion, lax collaterals, malalignment, or subluxation), radiographic evidence of joint damage, joint replacement surgeries, and extra-articular manifestations were examined. Among extra-articular manifestations we determined the presence of subcutaneous nodules and ocular (keratoconjunctivitis sicca, episcleritis, scleritis, scleromacia or uveitis), pulmonary (pleuritis, pleural effusion, pulmonary nodules, interstitial lung disease or pulmonary fibrosis), cardiac (pericarditis, myocarditis, valvular nodules or coronary vasculitis) and neurologic (neuropathies, peripheral neuropathy or mononeuritis multiplex) manifestations. The following comorbid conditions were determined: dyslipidemia, arterial hypertension, type 2 diabetes mellitus, metabolic syndrome (per the American Heart Association and National Heart, Lung and Blood Institute classification) [11], cardiovascular events (angina pectoris, myocardial infarction, peripheral artery disease, cerebrovascular accidents or heart failure), peripheral venous disease, obstructive pulmonary disease, malignancy, depression, osteoarthritis, fibromyalgia syndrome (FMS), chronic low back pain, and osteoporosis.

Disease activity was assessed using the European League Against Rheumatism (EULAR) Disease Activity Score 28 (DAS28) [12]. The number of RA exacerbations (onset of new joint, organ or system involvement, worsening of previous coexistent condition, or disease that requires modification of therapy) and hospitalizations attributed to RA were also evaluated. Functional status was assessed with the Health Assessment Questionnaire (HAQ) [13].

The cumulative exposure and duration of therapy for the following therapeutic agents was recorded: corticosteroids, non-steroidal anti-inflammatory drugs (NSAIDs), antimalarials, methotrexate, sulfasalazine, azathioprine, leflunomide, gold salts, cyclosporine, infliximab, etanercept, adalimumab, anakinra, rituximab, and abatacept.

Statistical Analysis

The Statistical Package of Social Sciences (SPSS: Chicago III, 12.0 version) program was used to perform univariable and multivariable analyses. Differences between study groups were analyzed with chi-square, Fisher’s exact and Student’s t tests. Variables that were significant in the univariable analyses were entered in logistic and linear regression analyses

controlling for age, disease duration, gender and smoking. A p-value of 0.05 was considered to represent statistical significance.

Results

A total of 214 patients with RA were examined, 180 were females (84.1%). The mean age (standard deviation [SD]) was 56.6 (13.5) years and the mean (SD) disease duration was 10.8 (9.6) years. Sixty-seven patients were treated in the managed care setting and 147 patients received their healthcare in fee-for-service settings. Table 1 shows the demographic features and the health-related behaviors of study patients. RA patients in the managed-care setting were more likely to be smokers (16.4% vs. 5.4%, $p=0.009$) than patients with private health insurance. Conversely, there were no significant differences for age, gender, disease duration, alcohol use or likelihood to exercise among the study groups.

Table 2 shows the clinical manifestations, disease activity and outcome measures among the study groups. Patients in the managed care setting had more joint contractures/deformities (73.1% vs. 49.0%, $p=0.001$), extra-articular manifestations (82.1% vs. 56.5%, $p<0.001$); particularly ocular manifestations (49.3% vs. 23.1%, $p<0.001$) and subcutaneous nodules (46.3% vs. 24.5%, $p=0.001$) than patients in the fee-for-service setting. Moreover, patients treated in the public system had higher DAS28 (4.2 [1.8] vs. 3.3 [1.5], $p<0.001$) and HAQ scores (1.39 [0.84] vs. 0.97 [0.80], $p=0.001$). There were no differences for joint replacement surgeries, radiographic joint damage, ESR levels, and hospitalizations between these groups.

The comorbid conditions are depicted in table 3. The following conditions were more common in the managed care group: arterial hypertension (68.7% vs. 48.3%, $p=0.006$), type 2 diabetes mellitus (19.4% vs. 8.2%, $p=0.002$), cardiovascular events (14.9% vs. 2.0%, $p=0.001$), and FMS (7.5% vs. 0.7%, $p=0.005$). No significant differences were found for metabolic syndrome, peripheral venous disease, obstructive pulmonary disease, depression, malignancy, Sjögren's syndrome, osteoarthritis, low back pain, and osteoporosis.

As shown in table 4, managed care patients were less likely to receive biologic agents (22.4% vs. 48.3%, $p < 0.001$). No significant differences were observed in the cumulative exposure to NSAIDs, corticosteroids, and classic disease modifying anti-rheumatic drugs (DMARDs). Also, no difference was observed for the length of therapy for the latter medications (data not shown).

In the logistic regression analyses (Table 5), the following variables remained significant: joint deformities (odds ratio [OR] 4.80, 95% confidence interval [95% CI] 2.11–10.95), extra-articular manifestations (OR 4.27, 95% CI 1.97–9.23), arterial hypertension (OR 4.44, 95% CI 2.05–9.63), type 2 diabetes mellitus (OR 3.06, 95% CI 1.21–7.78), cardiovascular events (OR 3.78, 95% CI 1.47–9.70), FMS (OR 13.97, 95% CI 1.45–134.60), and the use of biologic agents (OR 0.22, 95% CI 0.10–0.45). Furthermore, in the linear regression analyses patients in the managed care group had significantly poorer functional status when compared to those in the fee-for-service group (coefficient 0.38, 95% CI 0.13–0.62).

Discussion

Studies comparing health outcomes of patients with RA that receive their care in fee-for-service versus managed care settings are limited. Our study showed that indigent Puerto Rican patients with RA treated in a managed care setting had more joint deformities, extra-articular manifestations, arterial hypertension, type 2 diabetes mellitus, dyslipidemia, cardiovascular events, and FMS than non-indigent patients treated in fee-for-service

settings. Also, patients in the managed care group had a poorer functional status and lower exposure to biologic agents.

Studies examining the association of joint deformities and functional impairment in RA with the type of healthcare insurance unveil inconsistent results. We found a higher frequency of joint deformities along with a higher degree of functional impairment among patients in the managed care group. However, these findings contrast those of Yelin and colleagues who did not find any significant differences in the arthritis symptoms, health status or working ability between patients treated in prepaid group practices and fee-for-service settings [14]. In agreement with the data of Yelin, a study by Ward et al compared the outcomes of RA patients with different types of health insurance and found that the average global arthritis scores, pain scores, and functional disability were comparable between patients in the managed care and fee-for-service practices [15]. Conversely and in concordance with our findings, a study by Solomon et al showed that patients from a public health care center had higher levels of functional impairment compared to those from a private care setting [16]. Moreover, Dessein and colleagues studied RA patients from public and private healthcare settings and found a lower functional status, as per the HAQ, in patients treated in a public setting [17]. Previous studies have linked healthcare received in a public practice with socioeconomic disadvantage, associating this factor to more physical disability and worse long-term outcomes in patients with RA [16].

A plausible explanation for the above discrepancies may be related to differences in healthcare utilization. While the reports by Yelin et al and Ward et al presented similarities in the healthcare utilization patterns between managed care and fee-for-service groups, the same finding may not necessarily apply to our population of RA patients. However, owing to the design constrictions of our study, data pertaining to measures of healthcare utilization were not available for all study patients and were not included in the final analysis. Pertinent information that was not examined in our study included the delay in referral to specialists and subspecialists (including the rheumatologist, physical therapist and orthopedic surgeon), the number of outpatient visits to the specialists, and radiographic and laboratory utilization. Another possible explanation for the differences between our study and others could be attributable to ethnic disparities. Previous studies evaluated mostly Caucasian patients, whereas our study included a population of Hispanics. For instance, compared with Caucasians, Hispanics with RA have a poorer functional status and global health scores, highlighting the impact of ethnicity in the health outcomes of patients with RA [18, 19].

Our RA patients in the managed care setting had more extra-articular manifestations compared to those in the fee-for-service setting. Ocular complications were predominant in this group of patients as well as the presence of subcutaneous nodules. These observations are particularly relevant for our population of RA patients given the fact that extra-articular manifestations have been linked to a worse prognosis, particularly with higher disease activity, functional impairment and mortality rates [20, 21].

Patients in the managed care group were more likely to smoke. Cigarette smoking has been linked to greater disease severity manifested by extra-articular manifestations and radiographic damage [22]. Moreover, smoking has been associated with a poor response to methotrexate and biologic agents [23]. Therefore, we might consider that the differences observed between our study groups could be accounted in part by cigarette smoking. However, these differences were retained in the multivariable analyses after adjusting for cigarette smoking.

We found that RA patients from the managed-care setting were more likely to have arterial hypertension, type 2 diabetes mellitus, and cardiovascular events. In agreement with our

findings, a study by Dessein and colleagues showed that patients receiving their healthcare in a public setting had a higher frequency of arterial hypertension and metabolic syndrome, and a lower functional status as compared to those receiving their healthcare in a private system [17]. These findings are particularly meaningful in a population of RA patients, since this chronic disease has been linked to a higher risk for atherosclerotic cardiovascular disease [24]. A lower socioeconomic status has been associated with an increase in coronary artery disease which has been related to increments in the psychological stress and to higher atherogenic profiles, among other associated factors [17, 25–26]. In order to be eligible for the public health insurance in Puerto Rico, the annual family income must be at or below the poverty level, for which this type of insurance is a surrogate marker of a low socioeconomic status. Unfortunately, data on the economic or educational status was not available for all of our patients, thus limiting our analysis of the contribution of these factors in the disparities observed between the study groups.

As noted, patients from the public group had a higher frequency of FMS. FMS is an important comorbid condition that has been linked to a worse outcome in patients with RA. Karpouzas et al studied a group of US Hispanics with RA and found that FMS was associated with higher disease activity (as per DAS28), lower functional status (as per HAQ), and lower quality of life (as per SF-36) [27]. However, when the individual components of the DAS28 were assessed, it was observed that the objective ones, including the number of swollen joints and the ESR, were not significantly different between the groups with and without FMS. Similarly, a study by Wolfe et al showed that RA patients with FMS had abnormalities in functional status, pain scores, disease activity and psychological status as compared to patients without FMS. Conversely, no discrepancies were noted between the study groups when evaluating disease severity markers such as radiographic erosions and the frequency of total joint replacements [28]. Thus, although RA patients with FMS have higher functional limitation, pain perception, and disease activity measures, many of these discrepancies can be linked to FMS itself.

In our study, the treatment profiles, including the use of traditional DMARDs and glucocorticoids, was similar between patients from managed care and fee-for-service practices. These observations are consistent with previous studies that report similar treatment profiles in RA patients from both healthcare settings [15]. Conversely, we demonstrated that RA patients from the managed-care setting were significantly less likely to use biologic agents when compared to those from the fee-for-service group. Our findings concur with previous studies that report a lower likelihood of use of biologic agents in patients with RA in health maintenance organizations (HMOs) when compared to those in other managed care and fee-for-service settings [29]. Biologic agents have been shown to reduce the severity of clinical manifestations, improve functional status, and retard radiographic progression of patients with RA [30]. Thus, these disparities in treatment profiles of RA patients may ultimately impact their long-term outcome. A lower exposure to biologic agents could translate into more joint deformities, functional impairment, and extra-articular manifestations as has been shown herein.

There are limitations to our study. First, this is a cross-sectional study and as such has the limitations inherent to this type of design. Second, the study sample size was small. However, this could be a reflection of the relative low prevalence of RA in Puerto Rico which is estimated in less than 0.5% [31]. In order to gather the highest possible number of patients, we studied all consecutive patients seen at university- and community-based clinics during the study period. The enrollment of patients resulted in an unequal number (67 versus 147); however, no significant differences were found for age, gender and disease duration between the study groups. Third, joint imaging data were not available for all patients, thus limiting a complete assessment of articular damage. Fourth, the assessment of access to

healthcare and utilization of services could not be thoroughly evaluated since relevant information was missing for a significant proportion of patients. For example, data on appointment delay, type of professionals delivering healthcare (e.g., general practitioners, specialists, subspecialists), and occupational or physical therapy were not studied. Fifth, relevant sociodemographic information such as educational level and income status was not ascertained. Sixth, data on patient's knowledge or education about RA, access to support groups, or social support were not available. Finally, it is possible that the population of RA patients from the managed care setting represented a sicker population because these were seen at our university-based setting, which is a large tertiary referral center for the island. In view of the limitations of our work, longitudinal studies are needed to address the possible causes for the disparities observed here.

In summary, our population of Puerto Rican indigent patients with RA treated in a managed care setting had more joint damage, extra-articular manifestations, type 2 diabetes mellitus, arterial hypertension, cardiovascular events, and FMS than those treated in fee-for-service settings. Moreover, these patients also presented more functional disability and had a lower exposure to biological agents. Managed care has become a prevailing form of organizing the delivery of healthcare due to its ability to substantially reduce medical costs [32]. However, caution must be employed when providing this form of healthcare in patients with chronic diseases such as RA to avoid disparities that may translate into worse health outcomes, and consequently place a significant burden on both individuals and society. Taken together, our findings underscore the importance of making broader efforts to decrease the inequalities observed among indigent patients with RA in Puerto Rico. The definitive goal is to curtail these disparities as to improve the outcomes of patients with RA.

Acknowledgments

This project was supported by grant 8U54MD007587-03 (RCMI Clinical and Translational Research award, University of Puerto Rico Medical Sciences Campus) from the National Institute on Minority Health and Health Disparities (NIMHD), and by unrestricted educational grant from Abbott Laboratories, Inc.

References

1. Weissman JS, Stern R, Fielding SL, Epstein AM. Delayed access to health care: risk factors, reasons, consequences. *Ann Intern Med.* 1991; 114:325–31. [PubMed: 1899012]
2. Pappas G, Queen S, Hadden W, Fisher G. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *N Engl J Med.* 1993; 329:103–9. [PubMed: 8510686]
3. Brekke M, Hjortdahl P, Thelle DS, Kvien TK. Disease activity and severity in patients with rheumatoid arthritis: relations to socioeconomic inequality. *Soc Sci Med.* 1999; 48:1743–50. [PubMed: 10405013]
4. McEntegart A, Morrison E, Capell HA, et al. Effect of social deprivation on disease severity and outcome in patients with rheumatoid arthritis. *Ann Rheum Dis.* 1997; 56:410–3. [PubMed: 9486002]
5. Harrison MJ, Tricker KJ, Davies L, et al. The relationship between social deprivation, disease outcome measures, and response to treatment in patients with stable, long-standing rheumatoid arthritis. *J Rheumatol.* 2005; 32:2330–6. [PubMed: 16331758]
6. Maiden N, Capell HA, Madhok R, Hampson R, Thomson EA. Does social disadvantage contribute to the excess mortality in rheumatoid arthritis patients? *Ann Rheum Dis.* 1999; 58:525–9. [PubMed: 10460184]
7. Alegría M, McGuire T, Vera M, et al. The impact of managed care on the use of outpatient mental health and substance abuse services in Puerto Rico. *Inquiry.* 2001–2002; 38:381–95. [PubMed: 11887956]

8. Hulme PA, Rios H. Healthcare reform in Puerto Rico. Managed care in a unique environment. *J Nurs Adm.* 1998; 28:44–9. [PubMed: 9484319]
9. Marín HA, Ramírez R, Wise PH, Peña M, Sánchez Y, Torres R. The effect of Medicaid managed care on prenatal care: the case of Puerto Rico. *Matern Child Health J.* 2009; 13:187–97. [PubMed: 18484174]
10. Arnett FC, Edworthy SM, Bloch DA, et al. The American Rheumatism Association 1987 revised criteria for the classification of rheumatoid arthritis. *Arthritis Rheum.* 1988; 31:315–24. [PubMed: 3358796]
11. Grundy SM, Cleeman JI, Daniels SR, et al. American Heart Association/National Heart, Lung, and Blood Institute. Diagnosis and management of the metabolic syndrome: an American Heart Association/National Heart, Lung, and Blood Institute Scientific Statement. *Circulation.* 2005; 112:2735–2752. [PubMed: 16157765]
12. Fransen J, van Riel PL. The Disease Activity Score and the EULAR response criteria. *Clin Exp Rheumatol.* 2005; 23:S93–9. [PubMed: 16273792]
13. Hochberg MC, Chang RW, Dwosh I, Lindsey S, Pincus T, Wolfe F. The American College of Rheumatology 1991 revised criteria for the classification of global functional status in rheumatoid arthritis. *Arthritis Rheum.* 1992; 35:498–502. [PubMed: 1575785]
14. Yelin EH, Shearn MA, Epstein WV. Health outcomes for a chronic disease in prepaid group practice and fee for service settings. The case of rheumatoid arthritis. *Med Care.* 1986; 24:236–47. [PubMed: 3951265]
15. Ward MM, Lubeck D, Leigh JP. Longterm health outcomes of patients with rheumatoid arthritis treated in managed care and fee-for-service practice settings. *J Rheumatol.* 1998; 25:641–9. [PubMed: 9558163]
16. Solomon A, Christian BF, Dessein PH, Stanwix AE. The need for tighter rheumatoid arthritis control in a South African public health care center. *Semin Arthritis Rheum.* 2005; 35:122–31. [PubMed: 16194697]
17. Dessein PH, Christian BF, Woodiwiss AJ, Norton GR, Solomon A. Public healthcare attendance associates with enhanced conventional and non-conventional atherosclerotic cardiovascular disease risk burdens in established rheumatoid arthritis. *Clin Exp Rheumatol.* 2010; 28:230–7. [PubMed: 20483045]
18. Yazici Y, Kautiainen H, Sokka T. Differences in clinical status measures in different ethnic/racial groups with early rheumatoid arthritis: implications for interpretation of clinical trial data. *J Rheumatol.* 2007; 34:311–5. [PubMed: 17304656]
19. Bruce B, Fries JF, Murtagh KN. Health status disparities in ethnic minority patients with rheumatoid arthritis: a cross-sectional study. *J Rheumatol.* 2007; 34:1475–9. [PubMed: 17552045]
20. Young A, Koduri G. Extra-articular manifestations and complications of rheumatoid arthritis. *Best Pract Res Clin Rheumatol.* 2007; 21:907–27. [PubMed: 17870035]
21. Turesson C, McClelland RL, Christianson TJ, Matteson EL. Multiple extra-articular manifestations are associated with poor survival in patients with rheumatoid arthritis. *Ann Rheum Dis.* 2006; 65:1533–4. [PubMed: 17038457]
22. Ruiz-Esquivé V, Gómez-Puerta JA, Cañete JD, et al. Effects of smoking on disease activity and radiographic progression in early rheumatoid arthritis. *J Rheumatol.* 2011; 38:2536–9. [PubMed: 22045838]
23. Saevarsdottir S, Wedrén S, Seddighzadeh M. Patients with early rheumatoid arthritis who smoke are less likely to respond to treatment with methotrexate and tumor necrosis factor inhibitors: observations from the Epidemiological Investigation of Rheumatoid Arthritis and the Swedish Rheumatology Register cohorts. *Arthritis Rheum.* 2011; 63:26–36. [PubMed: 20862678]
24. Avina-Zubieta JA, Thomas J, Sadatsafavi M, Lehman AJ, Lacaille D. Risk of incident cardiovascular events in patients with rheumatoid arthritis: a meta-analysis of observational studies. *Ann Rheum Dis.* 2012; 71:1524–9. [PubMed: 22425941]
25. Marmot MG, Bosma H, Hemingway H, Brunner E, Stansfeld S. Contribution of job control and other risk factors to social variations in coronary heart disease incidence. *Lancet.* 1997; 350:235–9. [PubMed: 9242799]

26. Rose G, Marmot MG. Social class and coronary heart disease. *Br Heart J*. 1981; 45:13–9. [PubMed: 7459161]
27. Karpouzas GA, Dolatabadi S, Moran R, Li N, Nicassio PM, Weisman MH. Correlates and predictors of disability in vulnerable US Hispanics with rheumatoid arthritis. *Arthritis Care Res*. 2012; 64:1274–81.
28. Wolfe F, Cathey MA, Kleinheksel SM. Fibrositis (Fibromyalgia) in rheumatoid arthritis. *J Rheumatol*. 1984; 11:814–8. [PubMed: 6596431]
29. Yelin EH, Trupin LS, Katz PP. Impact of managed care on the use of biologic agents for rheumatoid arthritis. *Arthritis Rheum*. 2005; 53:423–30. [PubMed: 15934109]
30. Quinn MA, Conaghan PG, O'Connor PJ, et al. Very early treatment with infliximab in addition to methotrexate in early, poor-prognosis rheumatoid arthritis reduces magnetic resonance imaging evidence of synovitis and damage, with sustained benefit after infliximab withdrawal: results from a twelve-month randomized, double-blind, placebo-controlled trial. *Arthritis Rheum*. 2005; 52:27–35. [PubMed: 15641102]
31. Fajardo Hermosillo LD, Mayor AM, Franco AE, MD, Morell CA, Román YM, Vilá LM. Malignancy in a Hispanic population with rheumatoid arthritis. *Ann Rheum Dis*. 2010; 69 (Suppl3):370.
32. Lubeck DP. A review of the direct costs of rheumatoid arthritis: managed care versus fee-for-service settings. *Pharmacoeconomics*. 2001; 19:811–8. [PubMed: 11596833]

Table 1

Demographic features and health-related behaviors in RA patients treated in managed care and fee-for-service settings

Features	Fee-for-service (n=147)	Managed care (n=67)	p-value
Age, mean (SD) years	57.4 (13.8)	54.8 (13.0)	NS
Gender, % female	83.7	83.6	NS
Disease duration, mean (SD) years	10.3 (8.5)	11.9 (11.8)	NS
Alcohol use, %	2.7	6.0	NS
Cigarette smoking, %	5.4	16.4	0.009
Exercise, %	18.4	17.9	NS

NS: Not significant, SD: Standard deviation

Table 2

Clinical manifestations, disease activity and outcomes in RA patients treated in managed care and fee-for-service settings

Features	Fee-for-service (n=147)	Managed care (n=67)	p-value
Joint deformities/contractures, %	49.0	73.1	0.001
Joint replacement surgeries, %	15.1	23.9	NS
Radiographic manifestations, %	49.7	53.7	NS
Any extra-articular manifestation, %	56.5	82.1	<0.001
Ocular	23.1	49.3	<0.001
Pulmonary	6.8	9.0	NS
Cardiac	2.0	0.0	NS
Neurologic	18.4	14.9	NS
Subcutaneous nodules	24.5	46.3	0.001
Elevated ESR, %	89.7	92.3	NS
Hospitalizations, mean (SD)	0.07 (0.3)	0.09 (0.4)	NS
Number of exacerbations, mean (SD)	3.2	2.1	0.019
Disease activity (DAS28), mean (SD)	3.3 (1.5)	4.2 (1.8)	<0.001
Functional status (HAQ), mean (SD)	0.97 (0.80)	1.39 (0.84)	0.001

NS: Not significant, SD: Standard deviation, ESR: Erythrocyte sedimentation rate, HAQ: Health Assessment Questionnaire, DAS28: Disease Activity Score 28

Table 3

Selected comorbidities in RA patients treated in managed care and fee-for-service settings.

Features	Fee-for-service (n=147) %	Managed care (n=67) %	p-value
Arterial hypertension	48.3	68.7	0.006
Type 2 diabetes mellitus	8.2	19.4	0.002
Dyslipidemia	55.1	41.8	<0.001
Metabolic syndrome	38.1	41.5	NS
Cardiovascular events	2.0	14.9	0.001
Peripheral venous disease	4.8	10.6	NS
Obstructive pulmonary disease	2.0	3.0	NS
Depression	6.8	10.6	NS
Malignancy	4.8	3.0	NS
Sjögren's syndrome	5.4	10.4	NS
Osteoarthritis	57.1	52.2	NS
Low back pain	10.5	14.9	NS
Osteoporosis	17.0	14.0	NS
Fibromyalgia	0.7	7.5	0.005

NS: Not significant

Table 4

Pharmacologic treatment in RA patients treated in managed care and fee-for-service settings

Features	Fee-for-service (n=147) %	Managed care (n=67) %	p-value
NSAIDs	87.1	87.9	NS
Corticosteroids	74.1	85.1	NS
Classic DMARDs	90.5	97.0	NS
Biologic agents	48.3	22.4	<0.001

NSAIDs: Non-steroidal anti-inflammatory drugs, DMARDs: Disease modifying anti-rheumatic drugs, NS: Not significant

Table 5

Factors associated with managed care system by logistic regression analysis *

Features	OR	95% CI
Joint deformities and contractures	4.80	2.11–10.95
Any extra-articular manifestation	4.27	1.97–9.23
Arterial hypertension	4.44	2.05–9.63
Type 2 diabetes mellitus	3.06	1.21–7.78
Cardiovascular events	3.78	1.47–9.70
Fibromyalgia syndrome	13.97	1.45–134.60
Use of biologic agents	0.22	0.10–0.45

* Controlled by age, gender, disease duration and smoking; OR: Odds ratio, CI: Confidence interval