The Role of Patient Education in Arthritis Management

The Utility of Technology

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• Osteoarthritis • Education • Technology • Arthroplasty • Hip • Knee • Telemedicine

KEY POINTS

- With increasing prevalence, new arthritis management strategies must be developed to curtail its pathologic prognosis.
- The use of information technology (IT) resources, including Web-based platforms and telemedicine, has demonstrated positive results and a growing demand.
- Emerging IT platforms can be used to optimize communication between patients and caregivers in novel ways that can improve outcomes.
- Patients may be able to identify their symptoms early on, and through self-help and exercise programs, gain control over their disease process.
- The Lifetime Initiative for the Management of Arthritis program is an innovative tool that provides a structured exercise regimen, and an easy-access, trusted information source.

INTRODUCTION

Arthritis is a chronic illness that negatively impacts the lives of millions of Americans. It is prevalent in approximately 23% of the US population and was recently reported to affect over 54 million US adults.[1] Per the US Centers for Disease Control and Prevention (CDC), by 2040, this number will increase to a staggering 78 million people, over a quarter of the nation's population.[1]

Osteoarthritis (OA), also known as degenerative arthritis, is the most common form of arthritis and is commonly considered to be associated with aging and obesity. The health and economic burden of OA continue to increase as the US population ages and life expectancy increases. To meet this growing need, the authors have considered how newly available information technology (IT) tools could be used for patient education and disease management. Specifically, the article discusses how IT-based patient education and intervention tools can address gaps in the management of OA. The objective is to modernize treatment, control costs, and improve overall patient outcomes. In the context of this literature review, the authors describe current concepts regarding the diagnosis and treatment of OA, and present a novel IT-based approach that they have developed for OA patients, which

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is referred to as the Lifetime Initiative for the Management of Arthritis (LIMA).

LIMA is designed to educate patients about OA, to differentiate diverse OA phenotypes using fingerprints of arthritic disease. The objective of the LIMA project is to identify patients for whom nonoperative management strategies are appropriate, to conserve health care resources, to improve the health status of individuals and populations, and to optimize surgical outcomes when arthroplasty is indicated.

DIAGNOSIS

A diagnosis of OA typically occurs after a positive physical examination indicates degenerative joint disease and is often confirmed by imaging. During examination, the physician may ask the patient to describe his or her symptoms, when the symptoms typically occur, what can make the symptoms better or worse, and inquire about what types of medications the patient is taking. The physical examination reports on gait, deformity, alignment, range of motion, locking, clicking, crepitus, pain, effusion, swelling, and ligamentous stability. At the authors' institution, an IT system has been developed that enables patients to complete validated questionnaires prior to seeing their physician, as part of standard care.[2] The system sends the questionnaires to patients via email prior to their visit, collects data in the waiting room if the questionnaire has not been filled out in advance, and makes this aspect of the patient's history available for review during the office visit. The authors use a measure of joint-specific symptomology (eg, the Knee Injury and Osteoarthritis Outcome Score, KOOS, or the Hip Injury and Osteoarthritis Outcome Score, HOOS), and a preference-based quality of life measure (EQ-5D). Sometimes advanced imaging modalities are prescribed, such as MRI or ultrasound. When patients present with a tense effusion, the joint may be aspirated and synovial fluid analysis performed.

Radiologic assessment of a joint remains the primary factor determining the diagnosis of OA. Paradoxically, radiographic OA in often observed in asymptomatic or minimally involved individuals.[3] The Kellgren and Lawrence (KL) grading scale has been employed to stratify disease severity based on radiologic imaging, dividing patients into 5 groups- Grades 1 through 5.[4] Because symptomatic OA does not always align with the radiographic images, the KL grades must only be used as an adjunct to patient reported pain in order to confirm the diagnosis.

RISK OF OSTEOARTHRITIS INCIDENCE AND PROGRESSION

The incidence and progression of osteoarthritis vary between patients based on several factors. Generally, OA prevalence increases with age.[5] Female gender carries increased risk of OA; the CDC found that OA prevalence was 18% in men and 24% in women.[1] Obesity can cause higher levels of strain on joints, increasing weight-bearing load and the rate of cartilage loss.[6] Obesity was linked to an increase in OA of the hand, hip, and most strongly, the knee.[6] Occupations that were more physically demanding, such as carpenters or dockworkers, were reported to have higher rates of OA.[6]

THE IMPORTANCE OF BIOMARKERS

Joint pain, the cardinal symptom of osteoarthritis, can be periodic or chronic, stable or worsening, disabling or manageable with activity limitation. However, symptoms often do not correlate with radiologic measures of the disease. Inflammation is sometimes clinically evident, but often OA patients experience joint pain with no overt signs of inflammation. OA is a disease with multiple phenotypes that can be clinically distinguished, and it is clinically important to consider phenotype when making treatment decisions.[7]

Although much information about patient OA phenotype can be based on clinical presentation, ongoing work is developing the use of biomarkers in blood and synovial fluid to more precisely inform phenotype-based treatment decisions.[8,9] The most extensively studied biomarkers are measures of cartilage degradation, and of synovial inflammation.[8,9] Cartilage degradation can be monitored via measures of matrix turnover, including type II collagen fragments and propeptide, collagen-associated matrix protein (COMP) and proteoglycan fragments (REFS).[8,9] The inflammatory status of a joint can be determined by measurement of synovial fluid biomarkers, and more precisely defined in terms of the activity of the local innate immune system, including the level of cytokines, chemokines, and protease activity (aggrecanase and metalloprotease forms).[8,9] TSG-6 activity in synovial fluid has been recently identified as a highly significant predictor of the risk for rapid radiologic progression and joint replacement, and is suggested to be useful to inform the timing of arthroplasty.[8,9] Measuring the TSG-6 activity may be important to identify patients at low risk for progression, who should not be rushed into arthroplasty. Joint pain and disability, the