Ultrasound and Power Doppler Ultrasonography Of Knee Joint in Patients with Hepatitis C Virus Induced Arthritis

Thesis

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Presented by

Rasmia Mohamed Hassan Mostafa Algohary

M.B.B.Ch.

Under Supervision of

Dr. Gaafar Mohamed Ragab

Professor of Internal Medicine

Faculty of Medicine

Cairo University

Dr.Omar Moawia Osman

Assistant Professor of diagnostic radiology

Faculty of Medicine

Cairo University

Dr. Mohamed Ahmed Fouad El-Ghobary

Lecturer of Internal Medicine

Faculty of Medicine

Cairo University

Faculty of Medicine

Cairo University

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Content

Abstract

We concluded that the combination of grey scale US and PDS could be used as a sensitive and reliable non-invasive and widely available method complementary to standard clinical assessment & laboratory measures for evaluating many rheumatic diseases in daily practice.

We found no specific ultrasonic feature specific for HCV related knee arthritis; however knee effusion is a predominant feature & the hypertrophied synovium not frequently found. No degenerative or destructive lesions was found to be related to the disease itself, however this should be confirmed by histopathological assessment.

The detection of synovitis & bone erosions at articular joint margins is an essential diagnostic criterion in RA, and it is routinely used as a valuable measure of diagnosis, prognosis and disease severity.

Finally we concluded that there is a role of inflammation in painful KOA, other causes of pain may be contributed to knee effusion, menscal extrusion, Baker's cyst & bursitis are frequent causes of pain in symptomatic KOA.

Key wards:

Ultrasound (US), Power Doppler Ultrasonography (PDU), HCV related arthritis (HCVrA).

List of Abbreviations

ACR	American college of rheumatology
AHMM	Anterior horn medial meniscus
Anti-CCP	Anti cyclic citrullinated peptide
BC	Baker's cyst
CE	Clinical examination
CR	Conventional radiographs
CRP	C-Reactive protein
CT	Computed tomography
DAS	Disease activity score
ELISA	Enzyme linked immunosorbent assay
EULAR	The European League Against Rheumatism
HCVrA	HCV related arthritis
KOA	Knee osteoarthritis
LTF	Lateral tibiofemoral
MC	Mixed cryoglobulinemia
MCL	Medial collateral ligament
MTF	Medial tibiofemoral
OA	Osteoarthritis
OMERACT	Outcome Measures in Rheumatoid Arthritis Clinical Trials
PCR	Polymerase chain reaction

PDU	Power Doppler Ultrasound
PF	Patellofemoral
RA	Rheumatoid arthritis
RF	Rheumatoid factor
SD	Standard deviation
SF OA	Synovial fluid signs of OA
SPSS	Statistical package for social sciences
US	Ultrasound

List of Tables

Introduction

Over the last years, several studies have highlighted the value of ultrasonography in rheumatology for a wide spectrum of indications, including early diagnosis, disease activity monitoring and disease progression monitoring as well as guided aspiration & guided injection ***(Grassi et al, 2008)***.

However using the Ultrasound (US) to differentiate HCV induced arthritis from other types of arthritis has not been sufficiently reported. The US has many advantages including its non-invasiveness, portability, relative inexpensiveness, lack of ionizing radiation, and its ability to be repeated as often as necessary, making it particularly useful for the monitoring of treatment. US can also be used for guidance of aspiration, biopsy, and injection treatment ***(Backhaus et al, 2001)***. It has also the ability to perform dynamic real-time imaging with contra lateral comparison ***(Lin et al, 2000)***. Power Doppler Ultrasound (PDU) provides a reliable and accurate method for visualizing blood flow in the synovial tissue ***(Walther et al, 2001)*** and so it may be a valuable tool to detect synovial vascularity and to assist clinicians in distinguishing between inflammatory and non-inflammatory synovium ***(Labanauskaitë & Darauskas, 2003)***. One notable drawback of sonography is operator-dependency; the quality and consistency of sonographic studies rely on the expertise of the examiner. Other limitations include a long learning curve and a physician time–intensive examination, particularly for beginners ***(Lin et al, 2000)***.

Arthritis is one of the several autoimmune disorders induced by HCV infection. There is not a specific clinical pattern of HCV-related arthritis (HCVrA), but two nonerosive subsets have more frequently been described: a RA-like polyarthritis and a less common mono-oligoarthritis

involving medium-sized and large joints, often showing an intermittent course ***(Olivieri et al, 2003)***. This latter subset is strictly related to the presence of HCV-induced mixed cryoglobulinemia and its cutaneous manifestations, in particular purpura ***(Plazzi et al, 2008)***. HCV related arthritis (HCVrA) & Rheumatoid arthritis can sometimes be difficult to be differentiated, as both may share the same pattern of bilateral symmetrical arthritis, RF can be positive in both and early disease may not reveal erosions in conventional radiography. Hence distinction of RA associated with HCV from HCV related arthritis is of importance for the choice of proper medication as early as possible.

Rheumatoid arthritis (RA) is a chronic systemic disease of unknown origin that predominantly involves synovial tissue. RA affects 0.5%–1.0% of the global population, with females affected more frequently than males. Early diagnosis and initiation of proper therapy help modify the course of the disease and reduce the degree of severe late squeals. Since early changes are non osseous in nature, ultrasound (US) and MR imaging are superior to conventional radiography and computed tomography (CT) in terms of disease detection. Power Doppler US with and without an echo-enhancing contrast agent may be helpful for the evaluation and quantification of disease activity. However, there is controversy about this issue in the literature ***(Sommer et al, 2005)***.

Osteoarthritis (OA) is a non inflammatory disorder of movable joints characterized by focal degeneration of joint cartilage and new bone formation at the base of the cartilage lesion (subcondral bone) and at the joint margin (osteophytes), ***(Beary et al, 2000)***. In OA, US complements both the clinical examination and radiological imaging by allowing the rheumatologist to recognize not only the bony profile but also to visualize the soft tissues. US is extremely sensitive in the detection of soft tissue

changes in the involved joints including the proliferation of the synovium and changes in the amount of fluid present within the joint ***(Moller et al, 2008)***.

Aim of the study

The aim of this study is to illustrate ultrasonographic findings obtained in knee joints of patients with HCV induced arthritis & whether these findings are differ from those detected in patients with RA or degenerative joint disease.