Clinical measures in rheumatoid arthritis and ankylosing spondylitis

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ABSTRACT
Except for morning stiffness, the clinical symptoms and the history of patients with rheumatoid arthritis (RA) and ankylosing spondylitis (AS) usually differ: the location in RA is mostly the hands and feet, and in AS rather the back. Patients with RA tend to be older (>50 years) and female, while in AS there are somewhat more often male and younger (<30 years) at onset of inflammatory back pain, the leading clinical symptom. The clinical examination of patients in the early phase of the disease is usually easier in RA, although arthralgia and arthritis may be difficult to differentiate. Joint counts are useful in states of high disease activity with polyarticular flares and more established disease. In comparison, in AS, young patients with back pain frequently show normal physical examens, a reduction of lateral spinal flexion and chest expansion are often the earliest signs which are also sensitive to change on therapy with biologics. The cervical spine may be affected in RA and AS – more frequenty in advanced disease stages but rather early cases have been reported.

The patient history and physical examination of the patient with musculoskeletal complaints are, of course, the basis for any approach to the patient in rheumatology as in all other medical disciplines. Recognition and documentation of structural and functional pathologies is of major importance in patients with rheumatic diseases such as rheumatoid arthritis (RA) and ankylosing spondylitis (AS). This is relevant not only for the diagnosis but also for monitoring, including clinical comparisons within the course of the disease which is usually rather variable in individual patients (1). Recognition of the patients' clinical state regarding disease activity, physical function and structural damage is essential for decision-making in terms of optimal patient management. Standardized measures and questionnaires are increasingly used to allow for comparisons between and within groups and patients. The differentiation between transient and permanent functional handicaps may be rather difficult in individual patients. Furthermore, certain findings in the patient history and clinical examination may have prognostic significance (2-8).

Physical examination of the patient should be performed ideally as described in the EULAR handbook of joint evaluation (9). For RA, the central physical examination of importance for clinical studies is the joint count, which may involve 68, 44 or 28 joints (10-14). Swelling and tenderness on palpation (or pain on motion) are assessed separately. Swelling performs better than tenderness of joints in terms of reliability and sensitivity to change (14), as tenderness is high subjective in individual patients. Joint counts are now also regularly performed by nurses and other medical assistants in certain clinical settings (15). However, the clinical diagnosis of arthritis or synovitis may be a challenge because

1. the joint may be painful rather than swollen
2. the joint may appear swollen but the patient denies any pain
3. the patient may be obese which may suggest swelling
4. the joint may have chronic structural changes due to the disease itself or surgery, but not have swelling or tenderness
5. the joint region may be swollen for other reasons (non-inflammatory oedema due to venous occlusion, heart insufficiency or hypoproteinemia)

Thus, the clinical assessment is critical for the diagnosis of arthritis vs. arthralgia which of course will have a major influence on diagnosis and management decisions.

In AS, the ASAS group has agreed on a core set of measures which should be regularly applied in the context of clinical studies and for clinical practice (16-19).

Of course, there are central differences and some similarities in the assessment of RA and AS, as predominant involvement in RA of peripheral joints, mainly hands and feet (more often in female patients, usually after 50 years of age) versus back pain as the most frequent complaint in AS. In the majority of cases, back pain is of inflammatory nature, more often in male patients, usually after 25 years of age. Thus, a direct comparison of the two diseases makes limited sense if we not focus on AS patients with peripheral joint involvement (in about 30-40% of all AS patients), and on the other hand on RA patients with involvement of the atlantoaxial joint (in about 10% of all RA patients).

In RA, joint counts have been the major tool for decades, to assess

1. diagnosis
2. disease activity
3. outcome
4. prognosis

Therefore, they are also part of the ACR core set and of prognostic criteria (1-6, 20). The question how many joints need to be examined in clinical studies has recently been answered (n=28) but clinicians often complain that the feet are not counted (21). As a matter of fact, the 28-joint-count is now frequently used for clinical trials and of course for calculation of the disease activity score (DAS28) (22, 23), although this approach includes limitations (24). The issue of joint deformities influencing joint counts has also been described (25-29). The simplified disease activity index (SDAI) (30), clinical disease activity index (CDAI) (30), and the rheumatoid arthritis disease activity index (RADAI) (31), a patient self-report joint count, are alternative assessment tools. Function in RA is frequently assessed by the health assessment questionnaire (HAQ) (32) and its derivative, multidimensional HAQ (MDHAQ) (33).

Symmetric polyarthritis, the number of swollen joints and high HAQ values at baseline were identified as risk factors for worse prognosis of RA 25 years ago (1, 2). Functional measures are predictive of mortality in (34). For the prognosis of early arthritis, the presence of radiographic erosions indicates a worse prognosis (4).

In a prediction model from 2002 consisting of 7 variables for RA patients clinical symptoms and examination played a major role: duration at first visit, morning stiffness for ≥1 hour, arthritis in ≥3 joints, and bilateral compression pain in the metatarsophalangeal joints. Application of the model to individual patients resulted in 3 clinically relevant predictive values: one for self-limiting arthritis, one for persistent nonerosive arthritis, and one for persistent erosive arthritis (35).

In another prediction model of 2008 consisting of 9 variables for undifferentiated arthritis (possible RA), clinical symptoms were also important: sex, age, localization of symptoms, morning stiffness, tender and swollen joint count. In addition, laboratory parameters (rheumatoid factor and anti-CCP antibodies) and imaging (erosions on radiographs) play a role (36).

Involvement of the atlantoaxial region may occur in RA and in AS. In Finnish RA patients, atlantoaxial subluxations (AAS) were found in 14%, and 5% had subaxial subluxations (37). Older age at baseline, greater disease activity during the first 5 years, and early erosiveness in peripheral joints predicted the development of atlantoaxial subluxations. In a later study of the same group (38), the prevalence of AAS, atlantoaxial impaction and of subaxial subluxation or previous fusion was 18%, 16%, 19%, and 5%, respectively. Importantly, only 69% of patients with cervical spine subluxations (those with fusions excluded) reported neck pain, compared with 65% of patients without subluxations.

In Greek RA patients, AAS were found in 21% and erosions of the odontoid process in 2%, while subaxial subluxations were found in 44%, and disc space narrowing at C2-C5 levels in 66%, and vertebral plate sclerosis and erosions in 44% (39). Whether the latter are specific for RA is unclear.

In Mexican AS patients, anterior AAS

Table I.

- Sacroiliac stress tests
  – Local pressure
  – Mennell
  – Patrick

- Spinal mobility
  – Lateral
  – Anterior (Schober)
  – Occiput or tragus to wall
  – Chest expansion
  – Cervical rotation

- Hip involvement
  – Intramalleolar distance
  – Rotation, abduction maneuvres

was observed in 21% and vertical AAS in 2%, while ossification of the posterior longitudinal ligament was present in 16 % (40). Progression of AAS was observed in more than 30% of the patients after 2 years (41).

While in RA the pathologic changes in the spine are largely restricted to the upper part of the cervical spine the whole axial skeleton may be affected in AS. The disease usually starts in the sacroiliac joints which are not or almost not affected in RA. In contrast to early RA, the physical examination in early AS or axial SpA may not be informative, because the findings are frequently normal.

Many assessments (Table I) tend to show positive (pathologic) results in more advanced disease stages of AS. The clinically most useful tests in earlier disease stages are lateral spinal mobility and chest expansion. Many of these tests are part of the Bath Ankylosing Spondylitis Metrology Index (BASMI), which is best used in its linear version or graded from 0–10 rather than 0–2 (42).

Function, enthesitis and extraarticular manifestations are discussed in other papers in this supplement.

In conclusion, history and physical examination of the patient with musculoskeletal complaints is the basis for the management of patients with RA and AS by the rheumatologist. This is also of major relevance to diagnosis, assessment of disease activity, outcome and prognosis. There are major differences but also some similarities between RA and AS. Especially the involvement of the cervical spine with atlantoaxial subluxation is of major importance not only because it may end fatal.

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