The Current Status and Problems in Clinical and Research Work on Temporomandibular Disorders in China

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Abstract: *The quality of clinical and research work on temporomandibular disorders (TMD) has increased rapidly in the last 30 years, especially in the last 20 years in China. The current status of clinical work and basic research achievements on TMD in China were surveyed. In addition, the establishment of the Chinese Society of TMD and Occlusion, the problems in TMD treatment and prospects of TMD clinical and research work in China are introduced and discussed.*

Key words: *China, research, temperomandibular disorders, treatment*

Introduction

In the last 30 years, and especially in the last 20 years, the quality of the clinical and research work on temporomandibular disorders (TMD) has increased rapidly in China[1-4]. TMD clinics, and diagnostic and treatment centres for TMD or for TMD and orofacial pain, comprising dentists from different specialties have been established in many dental schools in China. However, some problems still exist in TMD clinical and research work.

Clinical status

The study of temporomandibular disorders (TMD) includes many aspects and clinical problems that have been debated for years. This section focuses on two aspects: terminology and classification, and the treatment philosophy for TMD.

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Terminology and Classification

In the last two decades, the terminology of TMD has changed several times, and the term TMD has become more common in the literature in China and in the rest of the world[5,6]. However, the term TMD is a collective term that includes not only different entities of diseases or disorders of the temporomandibular joint (TMJ) itself, but also disorders of related masticatory muscles. This led many clinicians to describe different clinical disorders under this umbrella term, which has caused confusion in communication and research. Therefore, Laskin recently recommended that use of the term TMD should be discontinued[7]. This is reasonable because of the deficiency of the term, but it will take time for clinicians to fully understand this concept and change their habits. Therefore, it is important to produce a satisfactory classification of TMD for the present.

Early in 1973, the first classification of TMD in China was proposed by Zhen Kang ZHANG[8]. In this classification, three different categories were classified as TMD as follows: functional disturbance, internal derangements and organic destruction changes. Ankylosis, neoplasia and developmental abnormalities were excluded from this classification because they are different types of diseases from the disorders or diseases termed TMD. Thereafter, two further classifications of TMD were

proposed by Xu Chen MA and Zhen Kang ZHANG, in 1985 and 1998 respectively[5,9]. In the classification for TMD proposed in 1998, four different categories of TMD were identified as follows: masticatory disorders, internal derangements, synovitis and/or capsulitis, and osteoarthrosis. Sub-classifications of each category were also suggested. At the time, it was suggested that there were some deficiencies in this classification, especially the lack of a psychological categorisation, because there was insufficient evidence from the psychological field of TMD in China[5]. Since 1990, research work in this field has been strongly promoted and encouraged in China[3,5].

The Research Diagnostic Criteria (RDC)/TMD proposed by Dworkin and LeResche[10] is excellent concerning both somatic and psychological aspects for the diagnosis of TMD. The psychological problems of Chinese TMD patients were also demonstrated from an investigation using Symptom Checklists 90 revised (SCL-90-R) by a Chinese psychologist, where the patients got higher scores on depression, somatization, obsessive compulsion, anxiety, hostility, phobic anxiety and psychoticism[11]. However, RDC/TMD should be expanded both in Axis I and Axis II. Based on our research work and clinical experience in the field of TMD, and also based on RDC/TMD as well as other classifications[12] of TMD, Xu Chen MA and Zhen Kang ZHANG suggested dual-axis diagnostic criteria modified according to the situation in China, which included the diagnosis of somatic diseases on Axis I and psychosocial assessment on Axis II[13]. Axis I is almost identical to the 1998 classification proposed by Xu Chen MA and Zhen Kang ZHANG, and Axis II includes evaluation for pain intensity, disability and psychological status of the patients. The modified dual-axis diagnostic criteria are as follows:

Axis I: Evaluation for somatic disorders

1. Masticatory disorders
   a. Myofascial pain
   b. Myospasm
   c. Myofibrotic contracture
   d. Atypical pain of masticatory muscles

2. Internal derangements
   a. Anterior disc displacement with reduction
   b. Anterior disc displacement without reduction, with opening limitation
   c. Anterior disc displacement without reduction, without opening limitation
   d. Side disc displacements (medial or lateral)
   e. Rotating disc displacement

3. Inflammatory diseases
   a. Synovitis (acute, chronic)
   b. Capsulitis (acute, chronic)

4. Osteoarthrosis or osteoarthritis
   a. Osteoarthrosis or osterarthritis with disc perforation
   b. Osteoarthrosis or osterarthritis without disc perforation

Axis II: Evaluation for pain intensity, disability and psychological condition

1. Pain intensity and disability
   a. Grade 0: No TMJ and related muscle pain
   b. Low Disability: Low intensity pain
   c. Low Disability: High intensity pain
   d. High Disability: Moderately limiting
   e. High Disability: Severely limiting

2. Psychological status
   (All items of SCL-90-R should be evaluated)
   a. Normal: Item scores < population mean plus one SD
   b. Moderate: Population mean plus one SD < item scores < population mean plus two SD
   c. Severe: Item scores > population mean plus two SD.

A specific and correct diagnosis should be the primary consideration in the treatment of TMD patients. Correct treatment is only possible for the patient once a specific, correct diagnosis has been made.

The treatment philosophy for TMD

The philosophy for the management of TMD has changed dramatically in the history of TMD treatment, not only in China, but also in the rest of the world. One example is the role of surgery in treatment. Many operations were performed on TMD patients in China in the 1950s, '60s and '70s, including discectomy and condylectomy[14]. Towards the end of the 1970s, with arthrography and arthrotomography becoming more popular, the 'internal derangement theory' was developed[15-19]. Disc repositioning, disc repair and disc replacement by alloplastic materials or temporalis muscle flap prevailed in the 1980s[14,20].

At the end of the 1980s, disc replacement with alloplastic materials was stopped in China because several investigations indicated side effects from their use[21,22]. However, discectomy or disc replacement with temporalis muscle flap is still used in China for patients with severe disc degeneration or irreparable disc perforation.

It has been reported that the results of long-term follow-up support the use of discectomy for patients with painful internal derangement who show no improvement after prior nonsurgical treatment[23]. These results are consistent with our results of follow-up for these types of patients[24].

In the last ten years, with increasing knowledge of adaptive changes of the disc in patients with irreducible anterior disc displacement[4,25], the indications for discectomy and disc repositioning are less common in China[4,14]. Experience and clinical evidence has led to great change in the philosophy of treatment for TMD[4,6,12,13]. Currently, the goals for TMD treatment are primarily the quality of life and the function of the TMJ, rather than aiming for the 'correct' disc position[4,12,13,25,26]. With this philosophy of treatment, patients should be treated according to their individual situation. The primary considerations are to increase the patient's life quality and to recover the mobility or function of the joint, using conservative methods from the start.

Recently, it was suggested by Dolwick that surgery of the TMJ plays a small, but important role in the management of patients with TMD[27]. Patients should have strict indications for surgery, with severe symptoms that affect their quality of life (such as intolerable joint pain or mouth-opening limitation), failure to respond to conservative treatment, and imaging evidence of osteoarthritis and/or severe disc pathological lesions.

It is widely recognised in China that treatment of TMD should obey a 'step-by-step' approach[4,6,12], so that treatment begins with very conservative methods, followed by arthroscopic surgery, and finally to open surgery[4,12,13]. The conservative methods include education, physical therapy, drugs, muscular massage, opening exercises, acupuncture, Chinese traditional medicine, splints, intra-joint cavity injection (e.g. 2% lidocaine, sodium hyaluronate, prednisolone), arthrocentesis, simple occlusal adjustments, and other occlusion treatments. Open surgery is indicated only for the few patients whose quality of life is severely affected by TMD[4,12,13,25]. Additionally, more attention should be paid to psychological status in the diagnosis and treatment of TMD patients. Simple physical considerations are insufficient and could lead to mistakes in patient treatment. Therefore, dentists have to be convinced of the importance of understanding the biopsychosocial model of diseases in the diagnosis and treatment of TMD patients.

Basic Research Achievements

Since the 1970s, Chinese researchers have performed basic research in the field of TMD, with subjects including electron microscopy observations, cell biology of cartilage and synovium, tissue engineering, intra-articular pressure, immunology, and differential gene expression in TMJ cartilage after experimentally induced osteoarthritis. Increasing numbers of research articles on TMD and orofacial pain have been published in Chinese and in English[28-71].

Researchers found that 138 genes and expressed sequence tags were up- or down-regulated at least 2-fold in experimentally-induced osteoarthritis. Some of these genes have been shown to play a role in osteoarthritis, including matrix-degrading proteases, protease inhibitors and genes involved in cell growth, apoptosis and bone remodelling. Some of the genes had not previously been reported to be involved in osteoarthritis, such as *AQP3*, *SPP2*, *NOV*, *DKK3* and *EGLN3*, but were consistently up-regulated in this study, suggesting that they might be involved in osteoarthritis progression[50]. Regarding the immunological contribution to TMD, it has been found that immune reactions may be one important factor in the maintenance and severity of TMD[30], and cytokines such as TNF and deficiencies of IL-1ra, IL-10, and TGF-ß1 probably play an important role in the cause and pathogenesis of osteoarthritis[29,33].

Basic research achievements in China have covered many fields, and only a few studies are mentioned in the present report. A thorough review detailing basic research achievements should be made in the future.

Societies

The Chinese Society of Occlusion and the Chinese Society of TMD were created in 1989 and 1997 respectively. These two societies were combined in 2002, as the Chinese Society of TMD and Occlusion. So far, we have held seven national meetings on TMD and occlusion.

Problems and Prospects

I believe that in China we will have a much brighter future in the field of TMD because of the great efforts of our colleagues. The open policy of the Chinese government will offer more opportunities for the development of the fields of TMD and occlusion in our country. However, problems still exist: the academic levels of clinical and research work on TMD vary widely in different areas of China; psychological investigation has not been emphasised sufficiently in the treatment of TMD patients, especially for patients with chronic pain and with a tendency for secondary gain; international academic exchange and publication should be promoted further; and both clinical and basic research levels should be raised, emphasising the importance of evidence-based research.

This article is only a brief review of the current status and problems of clinical and research work on TMD in China, and only a few of the aspects concerned have been discussed.

It is impossible to cover all the relevant references published by our Chinese colleagues. The references cited are also not comprehensive owing to time constraints.

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