

# Overview of Research on the Treatment of Ankylosing Spondylitis in Chinese Medicine

Chen Gu<sup>1\*</sup>, Yuefang Li<sup>2#</sup>

<sup>1</sup>Medical Institute, Qinghai University, Xining, China

<sup>2</sup>Department of Acupuncture, Qinghai Provincial Hospital of Traditional Chinese Medicine, Xining, China

Email: 904832048@qq.com, \*1436897330@qq.com

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## Abstract

Ankylosing Spondylitis (AS), also known as spondylitis, is a rheumatic disorder that develops gradually in the sacroiliac, lumbar, thoracic and cervical spine and can involve peripheral joints in severe cases. The disease is insidious, starting in the sacroiliac and hip joints and gradually involving the entire spine. AS, also known as seronegative arthritis, is primarily due to a negative response to the susceptibility sheep blood clotting test (RF). Until the 1960s, it was known as “central rheumatoid arthritis” and “rheumatoid spondylitis”. At present, modern medicine has no effective treatment for this disease, but Chinese medicine treatment for ankylosing spondylitis is based on the concept of treating both the symptoms and the underlying cause of the disease, with few side effects and significant clinical effects, and has become a research hotspot in recent years, worthy of further investigation.

## Keywords

Chinese Medicine, Ankylosing Spondylitis

## 1. Introduction

Ankylosing spondylitis (AS) is an unpredictable and complex disease called “ankylosing spondylitis” because in the advanced stages of the disease, joints fuse together and lose their flexibility, preventing the spine from bending and moving naturally [1]. The causes and mechanisms of the disease are not fully understood, and diagnosis is difficult. AS is also known as “cancer that never dies” and is more common in men [2]. The incidence of AS in China is about 0.35%, and the disease has a latent appearance and a clear family history [3]. The

\*First author.

#Corresponding author.

disease has a latent appearance and a clear family history. Early symptoms of AS are clinically manifested as inflammatory low back pain (sacroiliitis) or stiffness, and in later stages, spinal ankylosis and deformity due to hypermobility of the spine may occur. The impact of spinal hypokinesia on quality of life is greater than pain, and patients with severe ankylosing spondylitis are unable to function properly or have a reduced standard of living due to spinal hypokinesia. In addition, the high cost of AS treatment adds to the burden on patients and families. A comprehensive understanding of the pathogenesis, diagnosis, treatment, and socioeconomic impact of ankylosing spondylitis helps reduce pain and stiffness in the spine and significantly improves the quality of life of AS patients [4]. Traditional Chinese medicine is a new way of thinking and treating allergic spondylitis by largely avoiding patients' dependence on Western medicine.

## **2. Pathogenesis**

### **2.1. Western Medical Pathogenesis and Treatment**

In response to the pathogenesis of ankylosing spondylitis, clinical treatment is usually symptomatic. The pillars of treatment for ankylosing spondylitis are nonsteroidal anti-inflammatory drugs, which provide greater relief from spinal pain and moderate benefit in restoring body function. However, NSAIDs can only strictly control symptoms; they are a class of anti-inflammatory drugs that do not contain steroidal structures; the drugs have anti-inflammatory, anti-coagulant, anti-rheumatic, analgesic and antipyretic effects; they do not alter the course of the disease or prevent structural damage. Corticosteroids, Anti-TNF [5], interleukin 17A [6] [7] and various dark and emerging biologic therapies are also frequently used in clinical settings to treat AS patients. However, the results of these treatments have not been satisfactory.

### **2.2. TCM Etiology and Pathogenesis**

Ankylosing spondylitis corresponds to the category of "paralysis" in Chinese medicine, and in ancient times the disease was called "bone paralysis", "great rickets", "bamboo wind". The disease is called "bone paralysis", "great rickets", "bamboo wind", etc. From the perspective of Chinese medicine, the causes of ankylosing spondylitis is mainly the following: external attack, congenital deficiency, loss of nourishment, and loss of nourishment of tendons and veins, which are closely related to the liver, kidneys, and the Governor's vein [8] [9]. The "Su Wen" mentioned: "waist for the kidney of the House, turn and shake the cannot, then the kidney failure." The "Medicine in the Heart of the West" mentioned: "Kidney deficiency, the Governor's vein will be deficient." The kidney is the master of bone and marrow, and the basic function of the kidney is to seal and store essence. Strong bones depend on the abundance of kidney essence, and kidney deficiency makes the Governor's Vessel inaccessible. The Governor Vessel is affected by evil and may involve many internal organs of the body [10]. The Governor Vessel is affected by evil energy and may involve several internal

organs of the body. In Chinese medicine, there are many different types of ankylosing spondylitis. According to the theory of diagnosis and treatment, the disease is generally divided into three types: cold-damp obstruction, phlegm blockage, and kidney and spleen deficiency. Clinical treatment of patients with ankylosing spondylitis is usually based on a phased approach due to the intermingling and transformation of evidence patterns.

### 3. Diagnostic Criteria and Observation Indicators

The main diagnostic criteria for AS are the New York criteria proposed for revision in 1984 [11]. It includes the following: low back pain  $\geq 3$  months, but pain does not decrease at rest and improves over time when active; lower thoracic motion range than normal motion range in the same age group; restricted mobility of the lumbar spine; unilateral sacral hip III - IV or bilateral sacral hip II - IV. The observed AS indicators include the patient's body function, pain level, overall patient assessment, and inflammatory indicators in 4 aspects [12]. In 2005, the EULAR and ASAS working group recommended ASAS evaluation methods in clinical practice, including overall VAS score, BASFI score, low back pain score and inflammatory response [13].

## 4. Chinese Medicine Treatment

### 4.1. Acupuncture Treatment

Acupuncture is a very effective method of treating ankylosing spondylitis by unblocking blocked meridians, supporting the body's positive energy, and expelling the diseased energy, which requires the addition and subtraction of acupuncture points to treat ankylosing spondylitis in conjunction with the patient's specific condition. With the development of evidence-based medicine, a large number of scholars at home and abroad have conducted clinical trials on the treatment of ankylosing spondylitis with acupuncture. Some scholars have pointed out that acupuncture treatment for AS can effectively reduce patients' spinal mobility and can greatly improve the quality of life of AS patients, such as morning stiffness and other clinical symptoms, which is worth using in clinical practice [14] [15] [16]. Liu Wei *et al.* [17] In 60 patients with ankylosing spondylitis, the conventional acupuncture method was chosen for clinical observation: acupuncture and warm moxibustion, adhered to 5 minutes per day 15 times. Results: The total effective rate was 75%. Li *et al.* [18] treated 60 patients with ankylosing spondylitis with acupuncture. The observation group used warm acupuncture with dialectical acupuncture and the control group used electroacupuncture, and the efficacy was 96.7% after treatment, compared with 76.7% in the control group.

### 4.2. Tui Na Therapy

In recent years, massage is often used to treat ankylosing spondylitis in clinical practice, and the condition of AS patients is improved by rubbing and plucking the lumbosacral region [19]. The operating parts of the back, mainly the bilateral

veins, can warm the Yang and pass through the Governor, replenish the kidneys and warm the meridians' blood circulation, so that the muscle state relaxes and restores its flexibility, improving the flexibility of spinal movement. In practice, tui na massage techniques should be based on soft techniques, not making the techniques too heavy. In order to achieve the purpose of replenishing its deficiency and returning its righteousness, the operation is carried out according to the direction of meridians. Zhu Li *et al.* [20]. To treat a patient with AS using tui na manipulation, the operator used the rolling method to massage the patient's neck, chest, and lumbar region back and forth along the spine and the affected side. There was a slight heat sensation in the local muscles. After muscle relaxation, sacral spinal muscles on both sides of the spine were plucked and popped, pushing the muscles to release the myofascial adhesions, plus point pressure on the lumbar back, and the total effective rate reached 91.11% after treatment. Yang Xiaofeng [21] Treatment of AS using Tui Na therapy, using Tui Na chiropractic movement techniques together with warm-up and toning acupuncture, has been effective.

### 4.3. Chinese Medicine Treatment

Chinese medicine therapy can generally improve the symptoms of back pain better, and some researchers have suggested that Chinese medicine can regulate the human immune system, prevent bone destruction and other functions. In clinical treatment of AS, the following drugs are often used in combination with the formula: Radix Aconiti warms the kidney and helps Yang relieve pain; Gui Zhi warms the meridians; Dou Wu and Wei Ling Xian dispel wind and dampness and stop paralysis and pain; Ge Ge Gen is good at treating strong pain in the collar and back; Deer horn gum tonifies the essence and blood, warms the kidney and Yang, and strengthens tendons and bones; Sang Sang Sang Sang tonifies the liver and kidney, nourishes the blood, dispels wind and dampness, and is good at relieving paralysis and pain; Cuscuta sinensis tonifies the kidney and essence and strengthens the waist and knees; Dog's spine and sequelae tonify the liver and kidney and strengthen the waist and knees; Xian Ling Spleen and Ox Knee Invigorates blood stasis, tonifies the kidneys and strengthens the tendons, and opens joints. Zhang Jianhua [22] the treatment of AS by using warm kidney and tonifying doudu soup together with appropriate daily uninterrupted five-animal exercise has been effective. Zhang Lianzhi *et al.* [23]. Treated AS by internal and external application of traditional Chinese medicine, the control group was treated with traditional western medicine, the observation group used oral Chinese medicine to tonify the kidneys and warm the yang and pass the governor soup with external application of Chinese medicine to the governor points of the vital gate, central pivot and lumbar yangguan in addition to the treatment group, the total effective rate of the observation group was significantly higher than that of the control group at the end of the course of treatment.

#### 4.4. Moxibustion Treatment

Moxibustion has the effect of warming meridians, dispersing cold and activating blood, tonifying kidneys and helping young people, and relieving pain. The Governor's Vessel is the meeting of all the yang in the body, also known as the "Sea of Yang Vessels", and has the function of harmonizing qi and blood. Therefore, moxibustion treatment of the Governor's Vessel can unblock meridians, disperse cold and paralysis, harmonize yin and yang, support the positive and dispel evil, and benefit qi and nourish deficiency. Moxibustion, fire dragon moxibustion, garlic moxibustion, heat sensitive moxibustion, and pan dragon moxibustion are commonly used in clinical practice to treat AS. MJ Liu *et al.* [24] Thermal moxibustion combined with acupoint injection was used to treat patients with ankylosing spondylitis; the control group was treated with conventional western medicine, while the observation group was treated with thermal moxibustion combined with acupoint injection. The total effective rate of the observation group was 28.8% higher than that of the control group at the end of treatment. Su Ping *et al.* [25] Moxibustion was used to treat 115 patients with AS. The moxibustion was applied to the backs of AS patients with appropriate amounts of musk powder, garlic paste, mulberry paper and moxa wool until the skin of the moxibustion area was flushed and blistered naturally, and the treatment was very effective. Fang Lina [26] *et al.* used fire dragon moxibustion combined with small acupuncture therapy to treat AS patients and found that patients' inflammatory response was reduced and spinal function was restored after treatment, with remarkable efficacy [27].

#### 4.5. Other Therapies

As a potential low-cost treatment, researchers have compiled available data to support the effectiveness of cupping therapy in improving outcomes for patients with ankylosing spondylitis. Zhang Baoxia [28] Acupuncture combined with Chinese herbal medicine hot compresses on the lumbar back were used to treat patients with AS. Drugs with the effect of warming the kidneys and helping the young, activating blood circulation, and combining acupuncture points such as Kidney Yu, Spleen Yu, Liver Yu, Governor's Vessel, Pinnacle Point, and A-Yi Point with hot compresses on the lumbar back were used for treatment. 3 months after treatment, the patient's spinal activity, morning stiffness time, and thoracic activity all improved compared to the previous indexes, with definite efficacy. Wang Zhaohui *et al.* [29]. Used pointer-type lumbar pain points combined with traditional Chinese medicine hot aman pack to treat AS. The control group took oral sodium loxoprofen tablets combined with traditional Chinese medicine hot aman pack for external treatment, while the observation group was treated with traditional Chinese medicine hot aman pack on the basis of lumbar back treatment combined with pointer-type treatment at lumbar pain points every day. After treatment, the lumbar pain symptoms of patients in the observation group were significantly reduced compared to the control group, and the

patients' lumbar pain symptoms were significantly alleviated. Zhang Rui *et al.* [30]. On the basis of the above treatment in the treatment group, together with Chinese herbal wax therapy and wax cake treatment, 126 patients with ankylosing spondylitis were selected, and the control group was treated with oral salazosulfapyridine enteric tablets, and the total effective rate of the treatment group was 71.42%, and the total effective rate of the control group was 50.79%.

## 5. Discussion and Outlook

Ankylosing spondylitis is a difficult clinical condition that affects mostly young men, and studies have found that the prevalence of the disease is related to age and gender, and the prognosis is also related to the affected joints. The rate of underdiagnosis and misdiagnosis of this disease is high, and timely treatment after diagnosis is necessary to reduce the disease, improve the patient's quality of life, and maintain his or her ability to work. Modern medicine believes that ankylosing spondylitis is closely related to the body's immune system, but the pathogenesis of the disease is still unclear, and the clinical treatment plan in modern medicine is symptomatic [31]. The clinical treatment plan is symptomatic. The main purpose of ankylosing spondylitis medication is to control the recurrence of symptoms, relieve pain, reduce inflammatory response, stiffness, and prevent joint deformation and other structural damage to the body [32]. However, modern medicine has many shortcomings in the treatment of AS, such as significant adverse drug reactions and higher costs of biological drugs. Chinese medicine is easy to operate, has few side effects, can be used for a long time, and can be adjusted in a holistic way to help the healing process and shorten the course of treatment. However, there are still shortcomings in the treatment of AS in TCM, among which the pathogenesis of the disease is not yet clear; there are not many cases, no large sample studies have been conducted and they are not representative enough, so the objectivity is not strong; the treatment is based on herbal medicine and acupuncture point formulas, and it is not easy to identify effective herbs or acupuncture points to play a therapeutic role; the disease is not cured for a long time, the efficacy of TCM is slow, and the patient's compliance is not high. Therefore, TCM AS needs to be combined with modern medicine to continuously verify and improve itself, improve the TCM treatment system, and promote the development of TCM so that it can better serve the cause of human health. Nowadays, with the increase in the number of patients with ankylosing spondylitis year by year, there are some problems such as poor efficacy of western medicine in society. Through the understanding of the research situation of traditional Chinese medicine in the treatment of AS, it is expected to play a certain role in the treatment of AS. Using modern science and technology combined with traditional Chinese medicine theory, a new method of diagnosis and treatment was explored from theory to practice. That is, traditional Chinese medicine therapy based on meridian syndrome differentiation, so as to relieve the pain of the majority of patients. This article has few references. I

hope to read more relevant material in future writing to improve the persuasive nature of the article.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- [1] Braun, J. and Sieper, J. (2007) Ankylosing Spondylitis. *The Lancet*, **369**, 1379-1390. [https://doi.org/10.1016/S0140-6736\(07\)60635-7](https://doi.org/10.1016/S0140-6736(07)60635-7)
- [2] Lord, P.A.C., Farragher, T.M., Lunt, M., Watson, K.D., Symmons, D.P.M. and Hyrich, K.L. (2010) Predictors of Response to Anti-TNF Therapy in Ankylosing Spondylitis: Results from the British Society for Rheumatology Biologics Register. *Rheumatology*, **3**, 563-570. <https://doi.org/10.1093/rheumatology/kep422>
- [3] Brown, M.A. (2009) Progress in Studies of the Genetics of Ankylosing Spondylitis. *Arthritis Research & Therapy*, **22**, Article No. 254. <https://doi.org/10.1186/ar2692>
- [4] Zochling, J. (2006) Current Evidence for the Management of Ankylosing Spondylitis: A Systematic Literature Review for the ASAS/EULAR Management Recommendations in Ankylosing Spondylitis. *Annals of the Rheumatic Diseases*, **65**, 423-432. <https://doi.org/10.1136/ard.2005.041129>
- [5] Bongartz, T., Sutton, A.J., Sweeting, M.J., Buchan, L., Matteson, E.L. and Montori, V. (2006) Anti-TNF Antibody Therapy in Rheumatoid Arthritis and the Risk of Serious Infections and Malignancies: Systematic Review and Meta-Analysis of Rare Harmful Effects in Randomized Controlled Trials. *JAMA*, **295**, 2275-2285. <https://doi.org/10.1001/jama.295.19.2275>
- [6] Baeten, D., Baraliakos, X. and Braun, J. (2014) Erratum: Anti-Interleukin-17A Monoclonal Antibody Secukinumab in Treatment of Ankylosing Spondylitis: A Randomised, Double-Blind, Placebocontrolled Trial. *The Lancet*, **382**, 1705-1713. [https://doi.org/10.1016/S0140-6736\(13\)61134-4](https://doi.org/10.1016/S0140-6736(13)61134-4)
- [7] Katsevman, G.A., Mariscal, G., Barrios, C., Fernández, P.D., Ziembinski, C. and Bhatia, S. (2020) Efficacy and Safety of Anti-Interleukin-17A Monoclonal Antibody Secukinumab in Treatment of Ankylosing Spondylitis: A Meta-Analysis. *Monoclonal Antibodies in Immunodiagnosis and Immunotherapy*, **39**, 160-166. <https://doi.org/10.1089/mab.2020.0022>
- [8] Feng, G.J., Li, D.D., Wang, H.D. and Tian, J.D. (2019) Exploring the Idea of Staged Treatment of Ankylosing Spondylitis from the Perspective of Liver, Kidney and Governor. *Asia-Pacific Traditional Medicine*, **4**, 82-84.
- [9] Liang, H.Y. and Feng, X.H. (2011) Professor Feng Xinghua's Understanding of the Etiology and Pathogenesis of Ankylosing Spondylitis. *Chinese Journal of Traditional Chinese Medicine*, **9**, 2012-2014.
- [10] Bradbury, L.A., Hollis, K.A., Gautier, B., Shankaranarayana, S., Robinson, P.C. and Saad, N. (2018) Diffusion-Weighted Imaging Is a Sensitive and Specific Magnetic Resonance Sequence in the Diagnosis of Ankylosing Spondylitis. *The Journal of Rheumatology*, **45**, 771-778. <https://doi.org/10.3899/jrheum.170312>
- [11] Alvarez Nemegeyi, J., Pelaez Ballestas, I., Rodriguez Amado, J., *et al.* (2011) Prevalence of Rheumatic Regional Pain Syndromes in Adults from Mexico: A Community Survey Using COPCORD for Screening and Syndrome-Specific Diagnostic Criteria. *The Journal of rheumatology*, **38**, 15-20. <https://doi.org/10.3899/jrheum.100953>

- [12] Anderson, J.J., Baron, G., Vander, H.D., Felson, D.T. and Dougados, M. (2010) Ankylosing Spondylitis Assessment Group Preliminary Definition of Short-Term Improvement in Ankylosing Spondylitis. *Arthritis & Rheumatism*, **44**, 1876-1886. [https://doi.org/10.1002/1529-0131\(200108\)44:8<1876::AID-ART326>3.0.CO;2-F](https://doi.org/10.1002/1529-0131(200108)44:8<1876::AID-ART326>3.0.CO;2-F)
- [13] Zochling, J., Vander, H.D., Burgos, V.R., Collantes, E., Davis, J.C. and Dijkmans, B. (2006) ASAS/EULAR Recommendations for the Management of Ankylosing Spondylitis. *Annals of the Rheumatic Diseases*, **17**, 453-458
- [14] Kumar, S., Doss, R.S.A., Rebekah, G., Mathews, N.S., Danda, D., Mathew, J. and Daniel, D. (2021) Prevalence of HLA-B\*27 Subtypes in the Tamil Population of India with Ankylosing Spondylitis and Its Correlation with Clinical Features. *Human Immunology*, **82**, 404-408. <https://doi.org/10.1016/j.humimm.2021.03.001>
- [15] Mcinnes, I.B., Gladman, D.D., Deodhar, A.A., Miceli, R.C., Nash, P. and Sattar, N. (2020) 15262 Cardio-Metabolic Effects of Long-Term Treatment with Secukinumab in Psoriatic Arthritis and Ankylosing Spondylitis Patients: Pooled 3 Year Analysis. *Journal of the American Academy of Dermatology*, **83**, AB33. <https://doi.org/10.1016/j.jaad.2020.06.219>
- [16] Choi, S.J., Oh, J.S., Hong, S., Lee, C.K., Yoo, B. and Kim, Y.G. (2020) Liver Enzyme Elevation in Patients with Ankylosing Spondylitis Treated with Tumor Necrosis Factor Inhibitors: A Single-Center Historical Cohort Study. *The Korean Association of Internal Medicine*, **35**, 723-731. <https://doi.org/10.3904/kjim.2018.407>
- [17] Liu, W., Zhang, L., Liu, B. and Zhou, Y.L. (2002) The Efficacy of Acupuncture in 60 Cases of Ankylosing Spondylitis. *Chinese Acupuncture*, **10**, 18-19. <https://doi.org/10.1016/B978-0-443-06589-7.50011-0>
- [18] Li, L. (2012) Clinical Observation on Acupuncture-Moxibustion Therapy in Treating Ankylosing Spondylitis. *Journal of Acupuncture and Tuina Science*, **10**, 318-320. <https://doi.org/10.1007/s11726-012-0628-3>
- [19] Yu, Z.H., Chen, F.X. and Zhou, S.H. (2002) Chiropractic Balance with Massage Therapy for Ankylosing Spondylitis. *Clinical Rehabilitation in China*, **6**, 792-793.
- [20] Zhu, Li., Wei, M., Li, Q., Feng, Y. and Zhou, J. (2019) Tui Na Treatment of Ankylosing Spondylitis in 45 Cases. *Journal of Traditional Chinese Medicine External Treatment*, **5**, 50-51.
- [21] Yang, X.F. (2019) Treatment of 41 Cases of Ankylosing Spondylitis with the Combination of Wenyang Tongdu Acupuncture and Tui Na Chiropractic Exercise Manipulation. *Guangming TCM*, **18**, 2858-2860.
- [22] Xu, W.B. and Zhang, J.H. (2017) An Overview of Professor Zhang Jianhua's Experience in the Treatment of Ankylosing Spondylitis. *Rheumatology and Arthritis*, **7**, 55-57.
- [23] Zhang, L.Z. and Zhou, X.J. (2022) Efficacy of Internal and External Application of Chinese Medicine in the Treatment of Ankylosing Spondylitis. *Chinese Traditional Medicine Science and Technology*, **4**, 617-619.
- [24] Liu, M.J., Wang, K. and Ren, C.J. (2013) Therapeutic Observation on Heat-Sensitive Moxibustionplus Acupoint Injection for Ankylosing Spondylitis. *Journal of Acupuncture and Tuina Science*, **11**, 173-176. <https://doi.org/10.1007/s11726-013-0683-4>
- [25] Xie, Y.X. and Su, P. (2003) 115 Cases of Ankylosing Spondylitis Treated by Pavement Moxibustion Therapy with Traditional Chinese Medicine. *Shanghai Journal of Acupuncture and Moxibustion*, **6**, 13-14.
- [26] Fang, L.N., Tian, L.J., Yuan, H.L. and Zhou, Y. (2022) Efficacy of Small Acupuncture Combined with Dragon Fire Moxibustion in the Treatment of Ankylosing



- Spondylitis and the Effect on ESR and CRP. *Clinical Journal of Acupuncture and Moxibustion*, **9**, 11-15.
- [27] Zheng, X.L. (2018) Cupping Therapy for Treating Ankylosing Spondylitis: The Evidence from Systematic Review and Meta-Analysis. *Complementary Therapies in Clinical Practice*, **32**, 187-194. <https://doi.org/10.1016/j.ctcp.2018.07.001>
- [28] Zhang, B.X. (2014) Analysis of the Mechanism and Efficacy of Comprehensive Treatment of Ankylosing Spondylitis Using Chinese Medicine and Acupuncture. *Clinical Research in Traditional Chinese Medicine*, **5**, 61-62.
- [29] Wang, Z.H., Cui, W.L., Xue, J.L. and Liao, Z. (2021) Clinical Efficacy of Finger-Acupuncture Lumbar Pain Points with Traditional Chinese Medicine Hot Aman Pack in the Treatment of Lower Back Pain in Ankylosing Spondylitis. *Xinjiang Traditional Chinese Medicine*, **5**, 25-28.
- [30] Zhang, R., Li, H.J., Chen, R.W., Chang, Y. and Zhang, C.Y. (2022) Clinical Study on the Treatment of Ankylosing Spondylitis with Chinese Wax Therapy Combined with Salazosulfapyridine. *Chinese Journal of Clinical Physicians*, **2**, 244-247.
- [31] Biggioggero, M., Favalli, E.G., Marchesoni, A. and Caporali, R. (2020) AB0671 Prevalence of Extra-Articular Manifestations and Impact on Targeted Drug Prescription in Patients with Spondyloarthritis: A Retrospective Analysis of a Real-life Cohort. *Annals of the Rheumatic Diseases*, **79**, 22-31. <https://doi.org/10.1136/annrheumdis-2020-eular.2472>
- [32] Bautista-Molano, W. and Navarro-Compán, V. (2014) How Well Are the ASAS/OMERACT Core Outcome Sets for Ankylosing Spondylitis Implemented in A Systematic Literature Review. *Clinical Rheumatology*, **33**, 1313-1322. <https://doi.org/10.1007/s10067-014-2728-6>