

Research on the Pathogenic Mechanism of Primary Osteoporosis: Purity & Turbidity Theory in Mongolian Medicine

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Abstract

To explore the traditional Mongolian medicine's understanding of primary osteoporosis based on the Purity and Turbid theory of Mongolian medicine. Primary osteoporosis was analyzed through the Purity and Turbid theory of Mongolian medicine, and the treatment of primary osteoporosis was explained by traditional Mongolian medicine. Primary osteoporosis is classified as Khey's disease in Mongolian medicine. Traditional Mongolian medicine has a historical understanding of this disease. The principles of treating Khey's disease and the theory of nourishment for the elderly explain primary osteoporosis. Through the analysis of primary osteoporosis using the theory of Purity and Turbid in Mongolian medicine, it is concluded that traditional Mongolian medicine offers a unique approach to treating primary osteoporosis. It is concluded that abnormal purity and turbid metabolism directly or indirectly affect bone metabolism and bone quality. Based on the analysis of primary osteoporosis using the Purity and Turbid theory of Mongolian medicine, it is concluded that traditional Mongolian medicine offers a unique approach to treating primary osteoporosis. Abnormal purity and turbid metabolism directly or indirectly affect bone metabolism, resulting in bone pain. General fatigue, waist and leg pain, sweating, and in severe cases fractures, suggest that the Purity and Turbid metabolism theory may be one of the pathogeneses of osteoporosis.

Keywords

Mongolian medicine, Purity & Turbidity Theory, Osteoporosis

Mongolian medicine is a traditional medicine accumulated and developed in the long-term process Mongolian people fight against nature and diseases. Similarly to other traditional medicines, Mongolian medicine has been developed based on practical experience; and theories appropriately explaining the occurrence and progression of diseases have been accumulated in a sustainable process of practice-theory-practice-theory again. In the long-term process of clinical practice-theory-clinical-theory again-and practice again, Mongolian medicine has developed the Chill-Fever Theory, Purity-Turbidity Theory, Three Element Theory, Disease Extrusion Theory, etc.

Diseases explained with Mongolian medicine theories

Purity-Turbidity Theory is about human metabolism, which uniquely interprets metabolic diseases of the human body. Primary osteoporosis is a systemic bone metabolic disease featured by reduced bone mass, and bone microstructure degeneration, resulting in feat fracture. The pathogenesis of the disease is mainly related to the following aspects. Osteoporosis' major pathological changes include three elements: reduced bone mass, bone microstructure changes, and declined mechanical carrying capacity of bone, accompanied by increased risk of fracture. If there is bone pain

on the preceding basis, skeletal deformities humpback, or fractures may occur. Primary osteoporosis is more commonly seen clinically, typically in postmenopausal women as well as middle-aged and elderly men. Secondary osteoporosis is seen in hormone users, and long-term heavy alcohol drinkers, or may be caused by fracture surgery and other reasons. The main treatment is to reduce further loss of bone mass; increase bone mass; relieve bone pain; and reduce the risk of fracture.

In Mongolian medicine, the human body has always been regarded as a whole united of opposites; and Chill-Fever Theory, Three-Element Theory, and Purity-Turbidity Theory are applied to explain the occurrence, development, and changes in the human body when healthy and sick. As to the understanding of osteoporosis, the disease name—osteoporosis has not been recorded in Mongolian medical literature. However, based on its clinical manifestations and characteristics, it is included in geriatric diseases of Mongolian medicine [1]. With the continuous development of Mongolian medicine and further completion of discipline construction, the disease is included in Mongolian Medicine of Bone Diseases [2].

1. Mongolian medical understanding of bone

In Mongolian medicine, the human body is regarded as an organic whole united by opposites. It studies various internal dynamic relations of human body from a macro perspective so as to clarify the basic law of life movement. In Mongolian medicine, there are seven elements (also known as seven factors) that constitute the human body, including food essence (nutrition), blood, muscle, fat, bone, bone marrow, semen, and continuously changing biochemical essence [3, 4], and three removals including stool, urine and sweat and other excretions. The existence of the seven elements relies on the three removals. Diet nutrition, blood, muscle, fat, bone, bone marrow, and semen seven are considered the basic seven elements, which further sublimate into the positive fluid by purity-turbidity secretion. The biochemistry of vitality and removals is the process of human metabolism, which is called purity-turbidity secretion in Mongolian medicine. The positive fluid produced by purity-turbidity secretion nourishes the basic vitality and supplements the three capabilities all the time and constantly absorbs essences and excretion of dross. Body metabolism may generally be performed by the digestive system and vitality biochemical system. Digestive metabolism works with the three heats, namely, when food passes through the digestive tract, it will be thoroughly decomposed in the stomach—thoroughly decomposed by “Ba Da Gan”, thawed out by digestive “Xie Ri”, and be differentiated into food essence by heat tuning “He Yi”. In the process, the sweetish taste is first generated to supplement “Ba Da Gan” and then a sour taste is generated to supplement “Xie Ri”, and finally, a bitter taste to supplement “He Yi”. The six-taste-based digestion process continues unceasingly. Moreover, a branched heat of the three digestion heats works to perform a high-level, subtle, and complex metabolism to secrete pure and turbidity and sequentially nourish the basic vitality. In the fifth stage of the process - the purity of fat nourishes bones; the turbidity includes sweat and lubricating substances; bone marrow is the purity of bones, teeth, nails, and hair are the turbidity of bones. Biochemical processes of the seven elements are closely related to each other. It will be healthy if all the processes are normal and any problem in any of the links may cause diseases.

2. Understanding of osteoporosis in Mongolian medicine;

Normal biochemical processes of the seven elements will ensure normal changes in bones, namely, normal bones. In Mongolian medicine, it is believed that people of different ages may suffer from different diseases—for children, diseases are most related to Ba Da Gan, for young adults, Xie Ri, and for the elderly, He Yi. When people get old, He Yi will accumulate in the body showing the features of He Yi symptoms. Osteoporosis caused by increased Heyi, kidney deficiency, and weakened stomach heat is analyzed based on clinical symptoms.

3. Principles of Mongolian medicine to treat osteoporosis:

From the perspective of Mongolian medicine, bones belong to "earth" in the five elements. The main reason why patients with osteoporosis are prone to fractures is that the qi and blood compete with each other and the body's ability to decompose essence and dregs is reduced. Therefore, in the treatment of osteoporosis When treating patients with the disease, the main focus is to "treat the disease before it is diagnosed", regulate the three roots, strengthen the body and eliminate evil, and carry out syndrome differentiation treatment based on the actual condition of the patient's body [5]. For elderly people with a high risk of osteoporosis, attention should be paid to regulating the patient's spleen, stomach, and liver functions during treatment. Adjustment of spleen and stomach function can enhance the patient's ability to digest and absorb food. Adjustment of liver function can enhance the patient's ability to decompose residues

and essences. ability, regulating Heyi, and nourishing [6]. In addition, it is also necessary to start with diet, daily life, external treatment, etc., and provide overall treatment to comprehensively improve the patient's condition. In traditional Chinese medicine, the principle to treat osteoporosis is that kidneys are vital to bones and the priority is to tonify the kidney; the spleen is vital to subsequent transportation and transformation of elements, and healthy and proper transportation and transformation as well as digestion and absorption of water and food essence are postnatal nourishment of fluids and bone marrow, which is fundamental to strengthening bones; and if sufficient vitality and unblocked blood circulation, food essence will be absorbed by organs and pass through major muscles and bones. Furthermore, it is to solidify elements and supplement essence; on such basis, more blood and meat products may help with vital essence [7]. Chinese traditional medicine has its appropriate principles and methods for the treatment of osteoporosis while traditional Mongolian medicine also has featured treatment of osteoporosis. In Mongolian medicine, it is stressed to "treat a disease before the onset of the disease", "seek the root cause", and "strengthen the body resistance to eliminate pathogenic factors"; to follow the principle of adjusting the three capacities to "different person, different timing, and local conditions"; and also to follow the principle dedicated to a disease, which may be varied for difference diseases. For treatment of diseases of the elderly: attention shall be paid to enhanced He Yi and declined gastric function, failure to eliminate essence and gastro-cardiac syndrome, as well as the conditions of the major veins, kidneys, as well as black and white veins. For the treatment of He Yi disease, generally, greasy and nutritious food is recommended to supplement positive fluids; the residence shall be quiet and warm to keep patients in a good mood. For conditions that are appropriate to give earth elements, it will be proper to provide much greasy and sweet, sour, or salty pharmaceuticals accompanied by moxibustion, massage, and other external treatment methods according to the principle of suppressing He Yi. Guarantee unblocked purity-turbidity metabolism, and strengthen the immune system and nutritional support for prevention of the occurrence of other complications. Four-Element Therapy: diet; behavior; medication; and operation; generally, for less severe cases, greasy and nutritious food will be given to supplement the positive fluids; residence shall be quiet and warm to keep patients in a good mood, and Andai dance; for earth element-based medium severe cases, heavy, greasy, and sweet, sour, and salty food and medication; for severe cases, administrate moxibustion, massage and other external treatments; for extremely severe or worse cases, comprehensive four-element treatment, that is, a combination of diet, behavior, medication, and operation.

4. Progress in Mongolian medicine for treating osteoporosis

4.1 Mao Haorichagan-5

The main function of Mao Haoricha Gan-5 is to nourish the kidneys and strengthen the body, and it has good application effects in the treatment of kidney cold, kidney deficiency, insufficient essence, and blood, and other diseases [8]. The drugs contained in it are Polygonatum odorifera, Polygonatum odorifera, Palm ginseng, Polygonum multiflorum, and Guangzao species. These five drugs are made into film-coated tablets through a special process, also known as Shenzhujing tablets, which are applied to the bones. In the treatment of patients with osteoporosis, it can promote the formation of bone tissue and inhibit bone resorption, which is of great significance for increasing bone density and improving various symptoms of osteoporosis patients (bone pain, soreness of the waist and knees, difficulty in walking, etc.).

4.2 Tong La Ga-5

Tonglaga-5 is a traditional medicine of Mongolian medicine. It was recorded in the "Selected Mongolian Medicine Prescriptions" as early as the 19th century. It has good application effects in the treatment of many common diseases and is also one of the commonly used clinical medicines. Tonglaga-5 contains many drugs such as pomegranate, white cardamom, safflower, cinnamon, etc. After collecting the drugs, they are processed using traditional techniques. It has a good effect in improving spleen and stomach function and can enhance appetite [9]. Based on data from other studies, it was found that Tonglaga-5 was used in the treatment of 87 patients with osteoporosis, of which 81 patients' conditions were effectively improved, and the overall treatment effectiveness was 93.10%. There are also studies that use rats as research subjects. They first use retinoic acid to induce osteoporosis in mice, and then use Tonglaga-5 to treat the rats. After investigation, it was found that the femoral bone density in the rats significantly increased, and the serum Calcium and phosphorus contents have also been significantly increased, and bone loss has been controlled. Various data have confirmed the application effect of Tonglaga-5 in the treatment of osteoporosis [10]. The drugs contained in Tonglaga-5 are all healthy drugs. The combined use of drugs has no toxic or side effects, and the comprehensive application effect in the treatment of osteoporosis is good.

4.3 Tubson-2

Tabson-2 is the most commonly used Mongolian medicine in the treatment of orthopedic diseases. Its main ingredients are *Eucommia ulmoides* and *Trichophylla ulmoides*. It has good bone strengthening and bone healing effects. Compared with other drugs, it has fewer adverse reactions. Features, it can be used for the treatment of postmenopausal osteoporosis patients. Relevant statistics show that the effective rate of Tabson-2 in the treatment of postmenopausal osteoporosis patients can reach more than 90%. Modern pharmacological research has found that Tabson-2 can effectively adjust Ca, P, Mg, and other elements in the body to a balanced state in the treatment of osteoporosis patients, which is also an important condition for the treatment of osteoporosis [11, 12]. The blue thorns contained in Tabson-2 are good medicine for strengthening bones, setting bones, and healing wounds. *Eucommia ulmoides* also has multi-target effects in treating osteoporosis, including directly intervening in bone reconstruction and bone differentiation and participating in the circulatory system. The nervous system interferes with the bone microenvironment in various ways.

4.4 Zhuangxi-4

Zhuangxi-4 flavor powder, also known as Chagan Gaoyou-4, Margaux-4, and Mongolian medicine Zhuangxi-4, is recorded in the "Encyclopedia of Chinese Medicine" (Mongolian Medicine Volume), which is composed of Hanshui Stone, *Cistanche deserticola*, rock sugar, and ground sugar. The prescription of Geda [13] is clinically used for clearing the day, digesting food, stopping vomiting, and stopping diarrhea. It has a good effect in preventing and treating osteoporosis [14]. Its single drug, Hanshui Stone, is rich in calcium sulfate, and *Cistanche deserticola* has an estrogen-like effect [15, 16]. Combined with the traditional efficacy of this drug, its mechanism of action may be to supplement calcium ions, estrogen-like effects, and promote gastrointestinal function to prevent Osteoporosis effects.

5. Conclusion

In summary, Mongolian medicine has significant application value in the treatment of osteoporosis, but there are few research samples in this area, the results are not uniform enough, and the comprehensive application value lacks elaboration. Purity-Turbidity Theory osteoporosis is a common disease the elderly are susceptible to. Studies on its pathogenesis in traditional medicine have not yet formed a complete system. With the deepening of the theoretical study of Mongolian medicine, we will continuously deepening our understanding of the disease, promote the understanding of the disease in Mongolian medicine, and also provide theoretical references for prevention of the disease in Mongolian medicine.

References

- [1] Meng Ke Bu & Si Qin Tu. A Primary Investigation of Mongolian Medical Diagnosis and Treatment of Osteoporosis [J]. *Journal of Medicine & Pharmacy of Chinese Minorities*, 2011, 16(1): 70-71.
- [2] Han Ba Gen Na. *Bone Diseases of Mongolian Medicine* [M]. Hohhot: Inner Mongolia People's Publishing House, Dec. 2006: 79-80.
- [3] Ba Ji Ge Mu De. *Mongolian Medical Basic Theory* [M]: Beijing: The Ethnic Publishing House, Mar. 1986: 55-57.
- [4] Cui Jian, Tang Li. *Introduction to Traditional Medicine of Chinese Minorities* [M]. Beijing: Beijing: Minzu University of China Press, Jun. 2007: 79-80.
- [5] Jin Dan. Clinical efficacy of Mongolian medicine in the treatment of primary osteoporosis [J]. *Chinese Journal of Ethnic Medicine*, 2019, 89(6):3-4.
- [6] Tubuxin. Hanbagen Mongolian medicine's theory of pure and turbid metabolism to explore the pathogenesis of primary osteoporosis [J]. *Chinese Journal of Ethnic Medicine*, 2017, 23 (3): 70-71.
- [7] Wang Hongfu. *Research Methodology and Technology for Drug Efficacy Study of Osteoporosis* [M]. Beijing: People's Medical Publishing House, Sept. 2009: 222.
- [8] Wuliji Tegusi. Wuyunsi Rigulin. Bai Yufeng, Wu Linxiang. Experience of Naheya Mongolian Medicine Ginseng and Bamboo Essence Tablets (Mao Haorichagan-5) in the treatment of kidney deficiency [J]. *Chinese Journal of Ethnic Medicine*, 2014, 23 (5):21-23.
- [9] Zhao Feng, Yan Chunlu, Zhang Yaping. Research progress of traditional Chinese medicine in the treatment of osteoporosis [J]. *Gansu Medicine*, 2016, 35(9):661-663.

- [10] Temu Ribagen. Tubu New Mongolian medicine Tonglaga_5-flavor pills on the intervention effect and mechanism of osteoporosis in rats caused by retinoic acid [J]. *Journal of Jilin University (Medical Edition)*, 2014, 40 (4):763-767.
- [11] Yang Maoren, Saihan. Discussion on osteoporosis during menopause [J]. *Chinese Mongolian Medicine*, 2018, 54(4): 31-32.
- [12] Qi Shufen, Zhao Jinfu. 78 cases of rheumatoid arthritis treated with Mongolian medicine [J]. *Chinese Journal of Ethnic Medicine*, 2018, 5(s1):12.
- [13] Bai Qingyun. *Encyclopedia of Chinese Medicine (Mongolian Medicine)* [M]. Chifeng: Inner Mongolia Science and Technology Press, 1986.7: 721.
- [14] Observation on the clinical efficacy of Tubuxin, Tonglaga, Se-Seridorji, Mongolian medicine Zhuangxi-4wei powder in the treatment of 60 cases of primary osteoporosis [J]. *Chinese Journal of Ethnic Medicine*, 2019.12(1):56.
- [15] Zhu Fangfei. Research on the estrogenic effects of the traditional Chinese medicine *Cistanche deserticola* [J]. *Journal of Harbin University of Commerce*, 2015.31 (1): 1-5.
- [16] Xu Xiaoxue. Study on the anti-osteoporosis pharmacodynamics and metabolomics of Roucongong and its active ingredients [D]. Ningxia Medical University. 2015:78-80.