

Analysis of Inpatients with Osteoarthritis

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Abstract [Objectives] To observe the distribution characteristics of TCM syndrome types, previous underlying diseases, and concurrent infections in inpatients with osteoarthritis, providing a basis for clinical precision treatment and chronic disease management. [Methods] Using an Access database, clinical data from 701 discharged patients with osteoarthritis who were admitted to the Rheumatology Department of Wuxi Traditional Chinese Medicine Hospital from January 2018 to December 2024 was collected. The statistical analysis on TCM syndrome types, previous diseases, and concurrent infections was conducted. [Results] Among inpatients with osteoarthritis, the highest proportion (55.21%) was attributed to the syndrome of liver and kidney deficiency in traditional Chinese medicine (TCM), followed by the syndrome of wind-dampness obstruction (15.98%), the syndrome of phlegm and blood stasis obstruction (13.27%), and the syndrome of dampness-heat obstruction (8.13%). The comorbidity rate of previous underlying diseases reached 87.87%, with the top three being hypertension (59.42%), osteoporosis (30.68%), and cerebral infarction (27.60%). Diabetes mellitus (19.80%), neuropathy (19.32%), and other conditions also accounted for a certain proportion. The main types of concurrent infections were urinary tract infections (36.21%) and pulmonary infections (33.62%), and upper respiratory tract infections accounted for 13.79%. [Conclusions] The TCM syndrome types of inpatients with osteoarthritis are primarily characterized by liver and kidney deficiency, as well as wind-dampness obstruction. Hypertension, osteoporosis, and cerebral infarction are the main comorbidities. Urinary tract and pulmonary infections are common types. Clinically, emphasis should be placed on syndrome differentiation and treatment, strengthening the comprehensive management of multi-system comorbidities, and optimizing prevention and control strategies of chronic diseases.

Key words Osteoarthritis (OA), Syndrome differentiation in TCM, Previous underlying diseases, Coinfection

1 Introduction

Osteoarthritis (OA) is a non-inflammatory degenerative joint disease, one of the most common joint disorders. Its main pathological changes include cartilage degeneration and osteophyte formation, leading to joint pain and dysfunction. In this paper, statistical analysis on the TCM syndrome types, previous diseases, and concurrent infections of inpatients with osteoarthritis was conducted, aiming to observe the comprehensive situation of inpatients with osteoarthritis in the rheumatology department and further optimize the medication regimen.

2 Data and methods

2.1 General data Case collection: 701 inpatients with OA in the Rheumatology Department of Wuxi Traditional Chinese Medicine Hospital from January 2018 to December 2024, including 506 females and 195 males.

2.2 Diagnostic and case inclusion criteria Diagnostic criteria: the *Guidelines for the Diagnosis and Treatment of OA* revised by the Orthopedics Branch of the Chinese Medical Association in 2018; TCM syndrome differentiation criteria: referring to the *Guiding Principles for Clinical Research of New Traditional Chinese Medicines (Trial)*; inclusion criteria: all patients diagnosed with OA who were admitted to the Rheumatology Department of Wuxi Traditional Chinese Medicine Hospital from 2018 to 2024; exclusion criteria: patients with OA without a clear diagnosis, as well as patients transferred out due to tuberculosis or sudden cerebrovascular disease.

2.3 Observation indicators and efficacy criteria 701 patients with OA from 2018 to 2024 were observed, focusing on their TCM syndrome types, previous diseases, comorbidities, and concurrent infections. Basic diseases: cerebrovascular disease, cerebral infarction, other brain diseases such as cerebral hemorrhage, cerebral hemorrhage sequelae, cerebral blood supply deficiency, *etc.*; cardiac lesions: coronary heart disease, cardiac insufficiency, arrhythmia, stent implantation, *etc.*; thyroid diseases: hyperthyroidism, hypothyroidism, thyroid nodules, thyroid tumors, Hashimoto's disease, *etc.*; respiratory diseases such as tuberculosis, emphysema, bronchiectasis, bronchial asthma, bronchitis, respiratory failure, *etc.*; digestive system diseases such as gastritis, ulcer, hemorrhage, erosion, reflux; neurological lesions such as ulnar, lumbar plexus, median, peripheral, autonomic nerves, *etc.*

2.4 Statistical methods The experimental data was statistically analyzed using SPSS 19.0 software.

3 Results and analysis

3.1 Gender distribution As can be seen from Table 1, the proportion of female inpatients with OA from 2018 to 2024 was significantly higher than that of males, with a total of 506 females (72.18%) and 195 males (27.82%). The male-to-female ratio was 1 : 2.6, indicating that the incidence rate among females was significantly higher than that among males.

3.2 Main TCM syndrome types of OA According to Table 2, among OA patients, the syndrome of liver and kidney deficiency was the most prevalent type, accounting for a total of 387 cases (55.21%), and its proportion ranked first in each year. It was followed by the syndrome of wind-dampness obstruction with 112 cases (15.98%), the syndrome of phlegm and blood stasis obstruction with 93 cases (13.27%), the syndrome of dampness-heat obstruction with 57 cases (8.13%), and the syndrome of qi and yin deficiency had the lowest proportion (4.85%).

Received: March 12, 2026 Accepted: May 19, 2026

Supported by the Wuxi Taihu Lake Talent Plan (202101); the Wu Jieping Medical Foundation Project (320.6750.2023-03-33).

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Table 1 Gender distribution of inpatients with OA from 2018 to 2024

Gender	2018	2019	2020	2021	2022	2023	2024	Total	Proportion//%
Female	85	101	71	65	46	57	81	506	72.18
Male	56	39	28	28	12	16	16	195	27.82

Table 2 Distribution of main TCM syndrome types of inpatients with OA from 2018 to 2024

Syndrome differentiation in TCM	2018	2019	2020	2021	2022	2023	2024	Total	Proportion//%
Syndrome of phlegm and blood stasis obstruction	24	21	8	10	9	10	11	93	13.27
Syndrome of liver and kidney deficiency	90	89	55	46	32	31	44	387	55.21
Syndrome of wind-dampness obstruction	11	19	22	11	10	13	26	112	15.98
Syndrome of dampness-heat obstruction	11	9	7	11	3	8	8	57	8.13
Syndrome of qi and yin deficiency	2	1	5	10	3	8	5	34	4.85

3.3 Previous diseases

3.3.1 OA combined with underlying diseases. 87.87% of OA patients had at least one underlying disease, and only 12.13% had

no previous underlying diseases, indicating a high incidence of multiple system comorbidities in OA patients (Table 3).

Table 3 Overall situation of inpatients with OA combined with underlying diseases from 2018 to 2024

Gender	2018	2019	2020	2021	2022	2023	2024	Total	Proportion//%
Combined	114	120	84	84	53	67	94	616	87.87
Uncombined	27	20	15	9	5	6	3	85	12.13

3.3.2 Main underlying disease of OA. According to Table 4, hypertension was the most common underlying disease, with a total of 366 cases (59.42%), accounting for nearly 60%; next were 189 cases (30.68%) of OA and 170 cases (27.60%) of cerebral infarction, which constituted the top three major comorbidities.

Diabetes (19.80%), neuropathy (19.32%), pulmonary interstitial disease (18.34%), digestive system disease (16.88%) were also high incidence complications, and heart disease accounted for 12.5%.

Table 4 Distribution of major underlying diseases among inpatients with OA from 2018 to 2024

Underlying disease	2018	2019	2020	2021	2022	2023	2024	Total	Proportion//%
Hypertension	69	66	50	58	33	40	50	366	59.42
Cerebral infarction	37	36	23	21	17	18	18	170	27.60
Coronary heart disease	13	12	13	11	8	8	12	77	12.50
Diabetes	22	25	20	13	8	16	18	122	19.80
Thyroid diseases	6	8	6	11	9	10	11	61	9.90
Respiratory diseases	6	6	5	5	1	5	9	37	6.00
Digestive system diseases	20	33	15	13	2	6	15	104	16.88
Neuropathy	22	29	20	12	10	8	18	119	19.32
Tumor	7	9	1	9	1	1	7	35	5.68
Osteoporosis	34	31	31	25	20	19	29	189	30.68
Interstitial lung disease	18	17	12	9	12	15	30	113	18.34
Renal insufficiency	1	3	2	5	4	5	7	27	4.38

3.4 Concurrent infection of OA A total of 116 patients had concurrent infections, with urinary tract infections accounting for the highest proportion (36.21%), totaling 42 cases; next were 39 cases (33.62%) of pulmonary infections and 16 cases

(13.79%) of upper respiratory tract infections; intestinal infection, skin and soft tissue infection, and other infections accounted for a relatively low proportion, at 3.45%, 4.31%, and 8.62%, respectively (Table 5).

Table 5 Distribution of concurrent infections in inpatients with OA from 2018 to 2024

Coinfection	2018	2019	2020	2021	2022	2023	2024	Total	Proportion//%
Upper respiratory tract	4	0	2	1	1	3	5	16	13.79
Lung	4	5	2	7	1	8	12	39	33.62
Intestine	0	0	1	0	1	2	0	4	3.45
Urinary tract	8	10	5	1	5	8	5	42	36.21
Skin and soft tissue	2	2	0	0	0	1	0	5	4.31
Others	3	0	1	1	2	1	2	10	8.62

4 Discussion

In this paper, by systematically analyzing clinical data of 701 OA inpatients, the core characteristics of gender distribution, traditional Chinese medicine syndrome types, underlying diseases, and coinfections were clarified, providing targeted references for clinical diagnosis and treatment.

In terms of gender distribution, women are a high-risk group for OA, which is closely related to the decrease in estrogen levels and abnormal cartilage metabolism in postmenopausal women. This suggests that more targeted early screening and intervention strategies need to be developed for the female population in clinical practice^[1].

The distribution of traditional Chinese medicine syndrome types reflects the core pathogenesis of OA, which is characterized by a deficiency of the liver and kidney as the root cause, and wind-dampness obstruction as the main syndrome types. This is consistent with the research conclusions of most regions in China^[1]. Due to differences in climate and environment in different regions, there are differences in the distribution of syndrome types. Clinical treatment should closely follow this pathological characteristic, strengthen the principle of "nourishing the liver and kidneys, dispelling wind and dampness, promoting blood circulation and removing blood stasis", and enhance the pertinence of treatment.

The interaction between underlying diseases and OA is a key focus of clinical management. As the most common complication, hypertension promotes joint cartilage damage through a dual mechanism of increased mechanical load and metabolic inflammatory reaction, and has a more significant impact on female knee joint function^[2]. Research has found that there is an interactive effect between OA and cardiovascular disease (CVD), with the continuous wear and damage of OA joints leading to the production of inflammatory cytokines. These factors are involved in endothelial function damage, cardiomyocyte apoptosis and repair of atherosclerosis in CVD^[3]. Endothelial cells regulate vascular tone by producing vasodilators such as nitric oxide (NO), and their dysfunction affects cartilage and synovial repair in OA. In OA, abnormal activation of endothelial cells promotes angiogenesis in synovium and subchondral bone, making it easier for inflammatory cells to enter the joint^[4-5]. In CVD, endothelial dysfunction aggravates the formation of atherosclerotic plaque. In this study, OA combined with osteoporosis accounted for 30.68%, ranking second. OA and osteoporosis are age-related degenerative and metabolic diseases of the sports system. The survey shows that these two diseases are related to age, estrogen level and other factors, and the incidence rate of these two diseases is significantly increased in postmenopausal women. After menopause, osteoporosis further leads to instability of the vertebral body and joints, resulting in compensatory bone hyperplasia, which in turn triggers the occurrence or progression of OA. In addition, physical activity of OA patients is limited, which can also lead to disuse osteoporosis. The two influence each other, creating a vicious cycle^[6]. Research shows that there is a potential

relationship between OA and stroke, and OA is significantly related to the incidence rate of stroke and transient ischemic attack (TIA)^[7]. In addition, OA is closely related to metabolic diseases. In the statistics of inpatients with OA, diabetes accounted for 19.8%. The study found that the risk of diabetes in OA patients was higher than that in normal people, and the risk of diabetes increased with the number of involved joints. The increased inflammatory mediators in patients with OA can promote insulin resistance through direct or indirect effects, and eventually lead to the occurrence of type 2 diabetes. At the same time, pain can reduce the amount of daily activities, increase the proportion of obesity and metabolic syndrome, and lead to the prevalence of diabetes rise^[8]. In this data analysis, OA accompanied by digestive system diseases also accounted for a relatively high proportion, which may be related to the adverse reactions of nonsteroidal anti-inflammatory drugs to the gastrointestinal tract to some extent. Research has found that there are certain levels of gastrointestinal (GI) risk factors among OA patients, most commonly associated with the use of high-dose NSAIDs, advanced age, and smoking. As the gastrointestinal risk gradually increases, the proportion of non selective NSAIDs inhibitors used gradually increases, the proportion of specific COX-2 inhibitors used gradually decreases, and gastric mucosal protectants are used more frequently in patients with GI risk^[9-10]. There is a two-way causal relationship between gastroesophageal reflux disease (GERD) and OA. GERD has an adverse effect on the incidence rate of hip OA and knee OA. Conversely, hip OA and knee OA also have a causal relationship with the increased risk of GERD^[11].

Coinfections are mainly urinary tract infections (36.21%) and pulmonary infections (33.62%). Rozin^[12] believed that the reasons may be due to the decline of immune function with age, as well as repeated infections caused by any cause and obesity accompanied by a large intestinal microbiota. Reducing body mass index is beneficial for OA patients, as it not only leads to mechanical improvements, but also reduces the number of gut microbiota and their migration to joints^[13].

In summary, the gender differences, TCM syndrome characteristics, multiple system comorbidities, and infection distribution patterns of patients with OA require a comprehensive management model of "diagnosis and treatment based on syndrome differentiation + multidisciplinary collaboration" in clinical practice. In the future, it is necessary to expand the sample size through multi-center cohort studies, deeply explore the intrinsic correlations between various clinical features, and provide more accurate theoretical support for the formulation of individualized treatment plans.

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