INTRODUCTION OF NEW DIAGNOSIS AND TREATMENT METHOD FOR TUBERCULOUS COXITIS IN THE RESEARCH-PRACTICE CENTER "PHTHISIATRY"

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Summary

The study presents epidemiologic indicators for extrapulmonary tuberculosis (EPTB) in the Sakha Republic (Yakutia) for the years 2002 to 2011. We describe the diagnostic methods that can be the most decisive ones, depending on various pathogenesis of EPTB: computed tomography, MRI, trephine biopsy of bones and joints that provides specimens fitting for histological and microbiological examinations. Finally, we present the results of the introduction of total hip replacement, a new high-tech treatment method for tubercular coxarthrosis and its sequelae, successfully performed in 17 patients.

Keywords: extrapulmonary tuberculosis, osteoarticular tuberculosis, coxarthrosis, trephine biopsy of bones and joints, total articular replacement

Incidence of extrapulmonary tuberculosis (EPTB) has been observed to decline steadily for the last decade, in the Russian Federation, and in the Sakha Republic (Yakutia) as well. The decline was observed also in the proportion of cases of EPTB within the tuberculosis (TB) incidence structure. Thus for 9 years the incidence of EPTB had decreased by 28%. While in 2002 the incidence was 3.2 per 100 000 population, in 2010 it was 2.5. Although Shilova M.V. noted (2005) that this decrease in incidence of EPTB was calculated based on all disease localizations, except osteoarticular TB. Levashev Yu.N. in 2006 noted that those rates did not reflect the real epidemiological situation for EPTB, and predicted the upsurge of the incidence in the next years.

Likewise, in Yakutia the incidence of EPTB has been tending to decline: 6.3/100 000 in 2002; 4.9/100 000 in 2006; 4.4/100 000 in 2011. Proportion of EPTB in the structure of TB incidence was 8.9% in 2002 and 5.9% in 2011. Thus, epidemiologic indicators for EPTB in Yakutia remain stable overall, and notably exceeding the same indicators in Russia (Table 1).

It should be pointed out, that in Yakutia, as in Russia, incidence of osteoarticular TB has not decreased, but instead has slightly grown, as opposed to decline in the incidence of EPTB of other

localizations. While in the 80-90s of the last century osteoarticular TB ranked 3^{d} by detection rate among extrapulmonary forms of tuberculosis, today it persistently ranks the 1st place in Yakutia. For example, incidence of osteoarticular TB among the cases of EPTB in Yakutia was 30.6% in 2002, 32.2% in 2005, 42.8% in 2008, and 41.3% in 2010. In 2011 the incidence of EPTB had grown abruptly, which to a large extent was due to increase in osteoarticular TB: 28 (66.6%) cases out of 42 newly identified patients with EPTB had osteoarticular TB. 8 patients with osteoarticular TB have been detected during 2 months in 2012 (Fig. 1).

According to the Order of the Ministry of Health no. 109, only one disease localization must be indicated for registration and recording of newly detected cases of TB. A patient with concurrent extrapulmonary and pulmonary TB will be registered as pulmonary case. Besides that, newly detected cases do not include relapsed cases, cases transferred out from other regions, and patients discharged from imprisonment. Because of this approach to dispensary follow-up of tuberculosis patients [T.N.: regular medical check-up and recordkeeping is termed 'dispensary follow-up'], up to a quarter of detected cases of osteoarticular TB are supposedly "lost".

At the end of 2009, in view of the observed growth of the percentage of osteoarticular TB in the incidence structure of EPTB in Yakutia for the last years, the administration of the 'Phthisiatry' Research & Practice Center had decided to reorient the extrapulmonary TB service to make it meet more fully the needs of patients with osteoarticular TB. So in January 1, 2010, the Inpatient EPTB Department was renamed to the Department For Osteoarticular And Genitourinary TB, with capacity of 50 beds, 30 of which are for patients with the disease of locomotion system. In November 1, 2011, bed capacity has been expanded to 55 beds, after being completed with additional "osteoarticular" beds.

Diagnosis of osteoarticular TB has some specific aspects. The pathogenesis of this disease is such that radiological method is the method of choice for diagnosis, because of its availability and decisive value. And accordingly, wide incorporation of high-end radiological diagnostic methods in Yakutia for the last years, such as x-ray computed tomography and MRI, allows the detection of patients with osteoarticular TB at primary network level.

It is a common knowledge, that in osteoarticular TB, tuberculous etiology of the disease is confirmed usually during the examination of surgical specimens. But in the majority of cases, surgery for osteoarticular TB is preceded by 1-2 months of preoperative anti-TB chemotherapy aimed at stabilization and containment of the pathological process, which makes bacteriological testing of the surgical specimens less diagnostic or nondiagnostic. That is why the use of controlled trephine biopsy of bones and joints becomes increasingly important in terms of histological and

microbiological verification of TB disease at early stage. Besides the above method, the Research & Practice Center 'Phthisiatry' will shortly be adopting arthroscopic interventions for diagnosis and treatment of the TB of major joints.

Introduction of newer diagnostic and treatment methods for osteoarticular TB, including high-tech methods, has been a long-standing need. This has become possible, when the new building of the 'Phthisiatry' Research & Practice Center, which is equipped to fit the modern requirements, has started to work.

In June, 2010 we have started to implement total hip replacement – new high-tech surgical treatment method for tuberculosis of the hip joint and its sequelae. Surgical operations were performed in assistance with the Traumatology Department of the Republican Hospital No.2 (Center for Emergency Medical Care).

During the next two years 17 total hip replacement procedures have been performed in the Department for Osteoarticular and Genitourinary TB. Out of 17 surgical patients, 8 (47.0%) had quiescent (inactive) tuberculous coxitis, the outcome of which was meta-tuberculous coxarthrosis; 4 (23.5%) patients who had TB of other localizations were operated for concurrent non-TB hip joint disease (1 (5.8%) patient with femoral neck fracture, and 3 (17.6%) with coxarthrosis deformans); 5 (29.4%) patients were non-TB cases who had nonspecific arthropathy.

Non-TB diseases of hip joint included: 5 (29.4%) cases of coxarthrosis deformans in parallel with Perthes' disease; 2 (11.7%) cases of non-consolidated femoral neck fracture; 1 case (5.8%) of coxarthrosis deformans in parallel with congenital dislocation; 1 case (5.8%) of coxarthrosis deformans due to past history of traumatic hip dislocation.

The majority (n=13; 76.4%) of the operated patients were male. By age-groups, patients were predominantly above 50 years old, although patient age ranged from 28 to 70 (mean age was 53.5). The majority of patients were aboriginal residents (n=12; 70.5%). By rural/urban residence, patients were distributed to almost equal groups: 9 (52.9%) and 8 (47.1%), respectfully.

Duration of the disease varied from 1.5 years (tuberculous coxitis) to 69 years (congenital hip dislocation).

Absolute majority of the patients (n=16; 94.1%) had an assigned disabled status by the time of surgical intervention. Of them, 2 patients had grade III disability (11.7%), 13 patients had grade II disability (76.4%), and 1 patient had grade I disability (5.8%). All personal rehabilitation programs of the patients included total hip replacement as the recommended operative treatment. Henceforth, Federal Social Insurance Fund reimbursed expenses for purchase of prostheses from the suppliers. Multimodality in-patient treatment (preoperative examination, operation, postoperative care) was

kept on budget of the institution. Later and in the future, the treatment should be at the expense of federal budget, provided that the 'Phthisiatry' Research & Practice Center receives the federal quotes of high-tech medical care (the appropriate license was granted to our institution in 2011).

All surgical interventions were performed under x-ray image guidance using Ceraver and Smith&Nephew surgical instruments. 7 (41.2%) joint implants by Ceraver and 10 (58.8%) by Smith&Nephew were fitted. Of the 17 prosthetic implants, 4 (23.5%) were metal-on-polyethylene, 3 (17.6%) metal-on-ceramic, 5 (29.4%) ceramic-on-ceramic and 5 (29.4%) were titanium nickelide implants.

Most of the patients (n=13; 76.5%) were operated under spinal anesthesia, and 4 (23.5%) – under general anesthesia. In early postoperative period all patients had been observed in the Department of Anesthesiology and Emergency Care for 1-5 days. All patients received prophylactic low molecular heparin, with coagulogram monitoring, and were treated by antibacterial therapy with cephalosporin. Surgical wounds in all cases healed by first intention. Within 3 to 7 days all patients started to use crutches to walk. In late postoperative period patients were prescribed physical therapy (ultrasonic therapy in combination with lidase; magnetic laser therapy) and massage.

In 1 case a complication occurred in late postoperative period (2 months after the surgery): dislocation of the femoral component of the prosthetic implant. The patient I., 51 years old, underwent total hip replacement with metal-on-polyethylene Ceraver implant on July 14, 2011. Wounds healed by first intention, and stitches were removed on day 10. On July 27, 2011 the patient was discharged at his own wish, and was prescribed further out-patient treatment at the place of his neighborhood. In his own words, the patient did not comply with the recommendations on weight-bearing limitations and the use of additional support, which 2 months after the surgery resulted in pain and movement restriction in the operated joint during wrong bodily movement made by the patient. After x-ray examination the patient was diagnosed with dislocation and was hospitalized again. In October 2011 replacement of the acetabular cup of the patient's prosthesis was performed with additional myotomy. The outcome was satisfactory.

In conclusion, introduction of high-tech surgical interventions for total hip replacement to the work of the specialty department of the 'Phthisiatry' Research & Practice Center can be acknowledged as successful. The further work to be done is staff training, surgical skill improvement and solving organizational issues. The current work on appointing patients from population groups followed-up in TB Dispensary for tuberculous coxitis, to surgical treatment is going on.

Table 1

Annual trends in the incidence of extrapulmonary TB per 100 000 population

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Sakha-Yakutia	6.3	5.3	5.4	3.3	4.9	3.8	3.7	3.2	3.0	4.4
Far East Federal District	н/д	3.0	3.3	3.0	3.1	3.4	2.6	2.7	2.8	n/a
Russian Federation	3.2	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	n/a

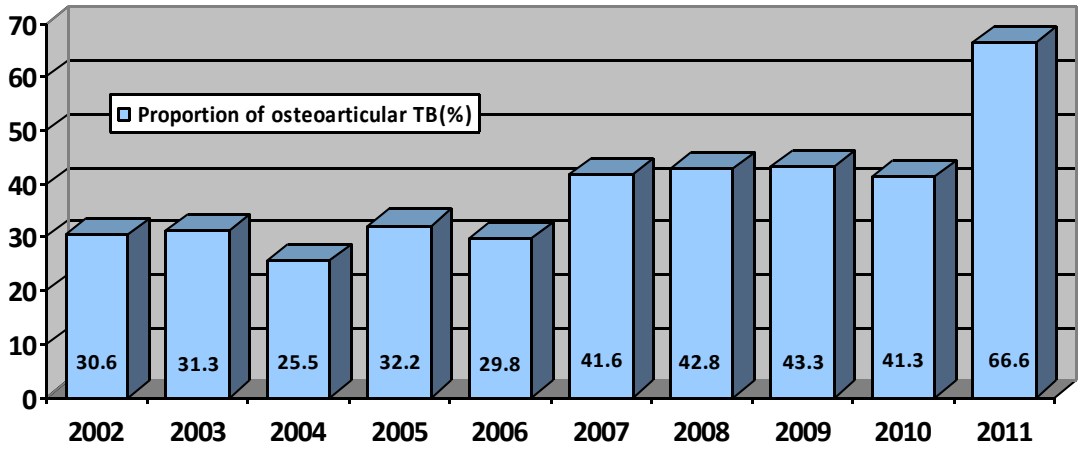

Fig. 1. Proportion of osteoarticular TB in the incidence structure of extrapulmonary TB, Sakha Republic (Yakutia), 2002-2011

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