MALABSORPTION SYNDROME is a clinical syndrome that is characterized by impaired absorption of nutrients, vitamins, minerals and drugs from the gastrointestinal tract.

DISEASES AND CONDITIONS THAT OCCUR WITH MALABSORPTION SYNDROME:

- diseases of the pancreas
- cholestasis syndrome of any etiology
- inflammatory bowel disease
- Crohn’s disease
- autoimmune enteropathy
- diabetes mellitus
- amyloidosis
- systemic sclerosis
- autonomic neuropathy
- hyperthyroidism
- Zollinger-Ellison syndrome
- atrophic gastritis

- neurofibromatosis
- resection of the pancreas, stomach
- infectious and parasitic gastrointestinal lesions
- HIV/AIDS
- TB
- alcoholism
- aging
ONE OF THE MOST SERIOUS CONSEQUENCES OF MALABSORPTION SYNDROME IN TB PATIENTS IS POOR ABSORPTION OF ORAL ANTI-TB DRUGS, WHEREUPON PATIENTS DO NOT REACH THEIR REQUIRED CONCENTRATION IN BLOOD AND FOCI OF INFECTION, WHICH LEADS TO TREATMENT FAILURE AND DEVELOPMENT OF MDR-TB
IN THE MAJORITY OF TB PATIENTS RECEIVING ORAL TREATMENT CONCENTRATION OF ANTI-TB DRUGS IN PLASMA IS EXTREMELY LOW

Presumably, this is caused by the decrease of functional intestinal absorption zone in TB patients. New ways of improving the bioavailability of anti-TB drugs are required.¹

Serum concentration of anti-TB drugs in patients with MDR-TB is further reduced.²

HIV-infected patients have malabsorption of anti-TB drugs even in the absence of symptoms of the gastrointestinal tract dysfunction.³

---

1. Valéria G. F. et al., Intestinal Permeability and Malabsorption of Rifampin and Isoniazid in Active Pulmonary Tuberculosis - The Brazilian Journal of Infectious Diseases 2006;10(6):374-379
3. Mehta JB et al., Utility of rifampin blood levels in the treatment and follow-up of active pulmonary tuberculosis in patients who were slow to respond to routine directly observed therapy. Chest 2001;120:1520–4
In patients receiving optimal anti-TB treatment per os, in which clinical, radiological or microbiological improvements are not achieved in the DOT regimen it is necessary to suspect the malabsorption syndrome.

**BENEFITS OF INTRAVENOUS ADMINISTRATION OF ANTI-TB DRUGS**

- 100% bioavailability
- Quick achieving the high concentrations of the drug in the foci of infection regardless of the state of the digestive tract, the characteristics of the diet and comorbidities
- Reducing the number of side effects
- Possibility to intensify treatment
- Reduction of cases of interruption of therapy (100% control)
- Accurate dosing


5. Treatment of Tuberculosis. - American Thoracic Society, CDC, and Infectious Diseases Society of America
Patients of the main group in the intensive phase of treatment as part of chemotherapy received isoniazid, rifamycin SV sodium and ethambutol intravenously, in the control group the same drugs in similar doses patients received orally.

The concentrations of anti-TB drugs in the blood and the foci of infection in patients of intravenous treatment group was almost 5 times higher than in the group of oral chemotherapy, which was accompanied by an increase in the frequency of sputum conversion in the intensive phase of treatment (94.7% vs. 79.0%, respectively) and shortening time of healing cavities from 3.9 to 3.0 months (p = 0.05).
Our case is a 15-year-old male student, previously healthy and who presented with a 5-month history of cough, sputum, anorexia and weight loss (10 kg). He presented no vomits and his bowel history was normal, with no diarrhoea. He was taking no medication. He was non-smoker and had no alcohol or drug addiction. Clinical, radiological and microbiological evaluation supported the diagnosis of respiratory TB. Daily oral weight-adjusted standard combination therapy (isoniazid (INH): 300 mg, rifampicin (RIF): 600 mg, pyrazinamide (PZA): 1500 mg and ethambutol (EMB): 1200 mg) was started. Patient’s HIV status was negative. Sputum-culture exam confirmed Mycobacterium tuberculosis sensitive for all first-line drugs in use. Nevertheless, patient failed to improve (clinical and radiologically) and monthly repeated sputum smear during first 4 months of treatment showed persistence of acid-fast bacilli (AFB). Assuming the possibility of malabsorption of anti-TB drugs, patient was prescribed with intravenous INH, RIF and streptomycin (SM) while continuing intake of daily oral PZA and EMB. Meanwhile, patient began to improve clinically, 1 month after mycobacterial charge was significantly reduced and 2 months after he was asymptomatic and gaining weight. By that time chest X-ray was improving and since then sputum smear became persistently AFB negative. Cultural exams turned to negative only after the third month of treatment. This patient had good tolerance to intravenous treatment and no side effects.
INBUTOL (ethambutol hydrochloride, 10% infusion solution)
- 100% controllable therapy
- Maximal efficiency
- Maximal safety

ISONIAZID (100 mg/5ml syrup)
- Accurate dosing
- Convenient administration
- Pleasant taste and smell
- Lower risk of side effects

RIFONAT (30 mg/ml rifamycin concentrate for preparation of infusion solution)
- One of the most effective antituberculosis drugs
- Infusion administration provides for the highest effectiveness of treatment
- Lower risk of gastric side effects
- Overcome resistance of MTB

PASKONAT (paraaminosalicylic acid, 3% infusion solution)
- Long history of use in tuberculosis treatment
- Low development of MTB resistance
- Increases effect of other antituberculosis drugs