WHY DO THEY GO UNDETECTED?

PITFALLS IN DIAGNOSING PARASITE BURDEN BY CONVENTIONAL MEDICINE

Classical medicine has three ways to determine parasite burden:
1. **Direct evidence** of parasites in stool or blood, or by biopsy,
2. **Determining the eosinophil count,**
3. **Detecting specific antibodies.**

Direct evidence is, of course, the most reliable indicator. If segments (tapeworms) or eggs (nematodes and liver flukes) are found in stool, there is no doubt about parasite infection. However, direct evidence is a matter of chance and good luck. Tapeworm segments do not come out regularly, by no means on a daily basis. The stool must be monitored for many days, taking into account that the untrained eye may easily overlook a segment colored by stool. An uninformed host does not ascribe his troubles to parasites and fails to survey his or her stools. Nematode and liver fluke eggs may not be spread evenly in the stool. If the bile ducts are clogged, for example, by a cholesterol plug, a stone or by liver flukes themselves, the liver flukes lay eggs in front of the plug so that nothing penetrates into the stool. A similar situation occurs when parasites are localized outside of the intestine. There are a number of such cases, and I commonly encounter them. The laboratory technician then faces a task similar to looking for a needle in a haystack. Imagine taking a handful of hay from a stack and looking for the needle. If you fail to find it in the handful, you declare that it is not present in the stack either. Such a risk should be reduced by taking a stool sample repeatedly, ideally three times. This is not done in practice, partly for financial reasons, and partly because the physician orders stool sampling only to have the patient off his hands and fulfill his duty. He is not interested in the test results, being convinced that even the single sampling was unnecessary anyway. This is done on a standard basis by reference laboratories only, but you may not be lucky enough to have your samples sent there. There is one national reference laboratory assigned to deal with each type of parasite. Such a reference laboratory supervises the exact testing and awards accreditations to local laboratories that are able correctly to identify the kind of parasite in blind samples sent to them. If you have the misfortune to collect a piece of stool that happens to contain nothing, then even multiple sampling will be of no help. Nonetheless, the higher the number of samples, the higher the chance of capture.

Slipshod sampling in the consulting room often contributes to the failure. A “walnut” of stool should correctly be collected. How is the sampling done across the country? The nurse takes a skewer with cotton wool at the end, rolls the skewer in the mouth of the anus and wipes it on a glass plate. No wonder that such samples are always negative. We cannot protest, the tests have been made after all.
It is an intention or ignorance?
Why does the laboratory fail to raise its voice against a low-quality sample?
For the laboratory technician, it is simpler to send back a negative report and stay in peace. It begins at medical schools, where students should have been taught the correct procedures.

Vets are aware of the imperfection of direct evidence, having been taught that the **probability** of parasites being found in livestock stool **is just 1%** !!!!!! **PLEASE REMEMBER THAT FIGURE !** That is why it’s enough for a conscientious vet to find parasites in the stool of a single cow. He will then automatically treat the whole herd. At the end of this book, you

will read a story called **Belgrade**, in which a careful microbiologist had a patient bring successively 12 samples of stool. She only found roundworm eggs in the twelfth sample.

It is also the method in use that counts. A vet client told me that he worked in a slaughterhouse as an inspector. They cut meat from pigs in thin slices and looked for trichinella. Nothing was ever found. As soon as the **trypsin test** was introduced, however, trichinella cysts rose up from the dissolved protein mash. Trypsin is the enzyme that breaks down proteins.

The situation is different with viviparous parasites, which do not lay eggs, such as trichinella and filaria. Trichinella is sometimes accidentally found by ultrasonography or MR examination, provided that it has produced a larger cyst. However, as the view that trichinella worms have been exterminated still lingers in the lay as well as the professional public, nobody ever thinks about a trichinella cyst. The patient is told that he or she has any of the following: **lipoma, polyp, myoma, cyst, benign lesion, granuloma, and sarcoma**.

The same applies to the findings of hydatid-echinococcal cysts, where the most frequent diagnosis is **malignant tumor**. **Echinococcu**s is **widespread** in our population. There is a very good chance that you have no tumor but a common parasite cyst and that what you need is not chemotherapy but antihelminthics. The oncology "industry" is partly based on parasites. Aside from Echinococcus, oncologic mistakes may be caused by **trichinella worms, schistosome granuloma, and filaria clumps**. These may sometimes be evaluated as **hemangioma**. You may say: the biopsy must distinguish whether a parasite is present. But then, the laboratory technician would have to assume that a parasite is involved and would have to know how an old hydatid cyst looks like in cross-section. An echinococcal cyst – larval stage – starts growing from a microscopic egg. Initially, it is the size of a poppy seed and grows very slowly, even for several tens of years. In the beginning, it is liquid inside, but gradually jellifies and calcifies from the center outwards. Such a solid pea, porous in cross-section, may not resemble anything alive. A specimen broken off from the cyst is cut in thin slices. A microscopic exam reveals that no human cells are involved. **A cancer diagnosis is born**.

I quote from **MUDr. Kolářová, National Reference Laboratory, IPVZ Prague :**
"From the diagnostic point of view, imaging techniques, and serologic and histologic examinations are relevant. The method of choice is **USG** (ultrasonography) or **CT** (computer tomography), which can identify **advanced** forms of **AE** (alveolar hydatidosis – or a cyst of fox tapeworm – Alveococcus). If we use both methods simultaneously, it should be taken into consideration that **identical results are rarely obtained**, only with 42% of the patients. MR is useful for imaging pathological changes in the hepatic vascular system, but **is not reliable in establishing calcified deposits**. Compared with the above methods, we obtain the best results by means of **PET** (magnetic resonance with a contrast agent).

Despite their sensitivity, the **imaging techniques have their limitations**, however : In spite of a negative PET, recurrences of diseases have in some cases been established several years after the treatment. Basic laboratory examinations **are of limited importance** when **AE** is suspected. **eosinophils are usually lacking**; the monitoring of specific antibodies **is of little importance**, the **IgE** count being perhaps more telling. For inoperable patients, **long-term or long-life administration of benzimidazole** is necessary !"

Benzimidazole preparations kill only nematodes, being weak with respect to tapeworms. Platyhelminthes have to be killed by **praziquantel;** the treatment takes a few weeks only, with breaks over the weekends, so that we need no more than a total of 8-10 days. A Czech parasitologist prefers, for convenience, to devastate the patient's digestion for years by using the approved medication (**praziquantel** is not registered here). And now, he no longer has anything available, for **Zentel** was abolished two years ago. **THE STATE INSTITUTE FOR DRUG CONTROL, BRAVO** !!!

*"Until 2006, just one case of human AE had been described (a woman of 74 from Klatovy)**;** since 2006, a total of 6 AE cases have been recorded **(Lukáčová and Skalický 2008 and 2009)**"*

These are official figures, but Associate Professor Kolářová belongs to enlightened Czech parasitologists, who openly lecture and write that the population infestation rate with parasites is much greater than the tests are able to establish.

Those figures are refuted by the following e-mail, which I received in **November 2008**:
"Dear Mrs Bláhová, I have read your web contribution regarding parasites.
I want to tell you that I have undergone an operation for an echinococcus pseudocyst in my liver, so confirming that people in the Czech Republic are also afflicted with the disease. Doctors had watched me since 2006 with the diagnosis of **cavernous hemangioma**. When biopsy was carried out, no echinococcus was identified. It was only found by an histological examination after the surgery. I was told in the infection ward that the infection was rare and had been recorded in the Czech Republic several years ago. But I have found that there are many more such cases, 8 patients this year at this clinic alone (the client refused to give the name of the clinic). I have lost 60% of the liver tissue and have been treated with **Zentel**. I hope that the disease is not recurrent. I regularly undergo serological tests, which have so far been negative. Due to the sporadic occurrence, doctors seem to forget about this possibility."

Considering what we already know about the **alveococcus**, the examination methods, and **Zentel**, we shall hope that the woman is and will be all right.

The term metastasis is used for echinococcus as it is for cancers. Scolexes – tapeworm heads – swim in the liquid inside a young cyst. There may be tens or hundreds of them. If the cyst is broken down, its contents are emptied into the bloodstream, disseminating tapeworms throughout the body. This danger is present when biopsy is carried out carelessly.

With nematodes, the situation is, in theory, simpler. If eggs or even adult parasites are found in stool, it's fine. The female parasite must, of course, be in the intestine. **Toxocara cati** or **canis** is difficult to search for. According to the current state of knowledge, it does not multiply in our bodies because we are not suitable hosts for it. The larva then migrates through our body (hence its name larva migrans), looking for the right host. In so doing, it mechanically damages the tissues it is crawling through. It uses not only the bloodstream and the lymphatic system, but etches its way indiscriminately through tissues and muscles by means of its proteolytic enzymes. It encysts itself where it feels like it, using even our own tissues to accomplish this. I found it strange that it survives for so long, even for years, and it occurred to me that it may multiply in our bodies after all if we have been unlucky enough to swallow a larger number of eggs. Both females and males then hatch and give birth to

further issue, as do ascarids. However, all the literature was against it until I found the following note in **Lékařské listy No. 28/2001**: "Several times, especially in older papers, there appeared a report on infection of a human by adult individuals of the **Toxocara** genus, mostly by **Toxocara cati**. Four cases of adult **T. cati** worms found in the stool or vomit of small children were established." Experts explain this as a result of the child having swallowed larvae of higher development stages. But I am afraid that this is just wishful thinking and that roundworms forget to be fastidious in their endeavor to survive. After all, they have all they need in our bodies. Our organs are the same as those of dogs and cats**;** to top it off, they are larger. If they encyst and do not multiply, they are practically undetectable for classical medicine. The cysts are tiny. On rare occasions, small corridors caused by larvae can be found in the biopsy material.

The situation is still more complicated with protozoans. Lambliae Giardia intestinalis and amoebas Entamoeba histolytica, for example, are best sought in fresh, **still warm** stool, so it is ideal if the stool arrives in the lab **within half an hour after defecation**. But you would then need to bivouac in front of the lab door. As this requirement is difficult to fulfill, special thermos bottles are used, or rather should be used, to store and transport stool. Lambliae and amoebas are very sensitive to temperature and drying and soon perish if they lack their conditions for life. This is a trouble with amoebas because they are easily mistaken for white blood cells, and the laboratory technician can only distinguish them according to their characteristic amoeboid movement. When they stop moving, it is difficult to discover them under the microscope.

This advice is given to microbiological laboratory staff by **MUDr. RNDr. Hynek Lýsek** in the textbook **Parasitology** published by the Faculty of Natural Sciences of the Palacký University in Olomouc.
He writes:
"When Giardia intestinalis is suspected, I recommend that 3 to 6 stool samples be taken, but even 6 negative results **may not mean the absence of Giardia in the body** !"

Clearly, the man knows what he is talking about. He also warns students against other mistakes that may be made, whether in spreading on a glass plate or in staining. You know very well that stool sampling is not done three times, let alone six times. I **commonly** find lambliae and amoebas when testing by Salvia, and hear the same from my acquaintances who use Oberon.

Entamoeba histolytica is the most widespread parasite on the planet, afflicting hundreds of millions of people**;** it is spread on a cosmopolitan basis so that you should find it more strange if you don't find it than if you do.

Pitfalls in testing for malaria:
Plesnik, Travel Infections :
"When malaria is suspected, blood samples should be taken during the fever period when plasmodia are more likely to be detected. If the test is negative, it should be repeated three times every twelve hours. A thick drop as well as a blood smear stained by Giemsa should be examined."

This is not done in practice, with the exception, perhaps, of a VIP patient. I referred two patients with typical malaria symptoms, who had returned from endemic regions (Egypt, Bolivia), to two different locations (Prague, Brno). In **EAV testing**, mixed infection by

Plasmodia vivax, Plasmodia malariae, and Plasmodia ovale was found for one client, and **P. malariae** for the other. Neither the Brno laboratory nor the Prague center carried out sampling at the time of elevated temperatures, nor did they invite the clients for further sampling. The tests were negative. Thus, I gave both women **PLASMODIUM M.O.V.** special preparations.

To my surprise, there was an improvement in only a few weeks. The temperatures were falling, the fatigue rate was smaller, the paroxysms of sweating and chills rarefied, and the muscle pain, joint pain and headache softened. If I had been mistaken and they had received unnecessary preparations, there would have been no improvement. Thus, it is a cause for concern that you don't get help in this country when you have become infected abroad. Unfortunately, we are infamous for that in Europe.

Pavel Čermák et al. : Microbiological diagnostics : "Possible errors in the preparation of preparations **:** In light of the fact that our laboratory has repeatedly encountered smeared blood films prepared from venous blood which could not practically be evaluated, we recommend that a sample be taken from a finger as a matter of principle. The smear may be too thick, or the blood may be washed off the glass surface if a thick drop is applied. Individual erythrocytes are not well seen in too thin a smear. An inexperienced technician may mistake artifacts produced in staining for plasmodia. Too quick drying and heating damage erythrocytes. Disinfection residues penetrate into the blood in the preparation, resulting in blood cell deformation and making the identification more difficult. Another error is to make venous blood preparations with a time lag. A relatively short time lag – 15 or 20 minutes – is enough to affect the appearance of the parasites.

Lékařské listy No. 28/2001 :
A case of a patient who returned from Kenya and visited a physician because of fever, increased fatigue rate, and abdomen pain associated with vomiting. An examination showed enlarged tonsils, sharpened breathing, and pain in the right lower abdomen Urine without a positive finding, no pathological changes shown in full blood count. Positive serology for EBV. Enlarged spleen on abdomen ultrasonography.

The same fever and pain still persisted after a week of symptomatic treatment. New tests: hematuria, thrombocytopenia, **brucellosis** and **malaria**, with negative results. Not until the doctor contacted the München Institute for Tropical Diseases was the final diagnosis made: **Malaria tertiana – Plasmodium ovale**.

One of my clients, a foreign trade officer, who had traveled on business throughout the world, told me that tradition not only among his Czech and Slovak but also European colleagues who were forced to live for appreciable time in tropical and subtropical regions, had it that it's no use going home for treatment. Those who got sick went straight to the Netherlands for treatment. This former colonial country was forced over the centuries to develop efficient diagnostics and treatment for its nationals living in tropics and subtropics.

I add a case from November 2011 : The client had lived for several years in Ghana and several years in Egypt with her husband, an ambassador. She got infected in Ghana. A Ghana doctor had no problem to detect malaria from her blood and treated her. When in Egypt, she again went to a doctor in Cairo. He took a blood sample, detected malaria, and administered medicines. When she returned to her home country, sweating and temperatures intensified. She visited THREE different centers, but none of them detected

malaria, so she went away empty-handed. When she came to me for measurement, we detected another 3 kinds of malaria, including the tropical P. falciparum. The client told me that both African doctors had warned her against undergoing treatment for malaria in Europe. There are 58 malaria strains, and European labs are not equipped for the job. This is a tragedy from the point of view of a patient who falls ill with the local, more moderate but still pretty bothering malaria species such as P. vivax and P. malariae. At least 22 of my malaria patients having no travel anamnesis but living in south Moravia have typical malaria symptoms – excessive sweating, constant elevated temperatures, chill with shivering, ischemic limbs, hypersomnia and tiredness, cyclical course of the disease.

Direct evidence of filariae :
Evidence of filariae is obtained either by biopsy on a skin nodule or by **repeated** blood sampling. Due to the time difference between the place of infection and the patient's residence, blood samples should be taken every 6 hours: Microfilariae circulate in the body, and their count in the peripheral blood fluctuates during the daytime. "For symptomatic patients, microfilaria are rarely present in the peripheral blood." **(MUDr. František Stejskal)**

No medicines for filariasis treatment have been registered in the Czech Republic. Outside the Czech Republic, **Ivermectin** or **Hetrazan** (with diethylcarbamazin as the active ingredient) is used.

*A client, a geologist who had traveled on business throughout the world, had troubles on returning from a business trip and visited a specialist-physician at Bulovka. The physician found a borderline count of **filariae** on testing. For an unclear reason (unavailability and price of the medicine ?), he did not start treating the patient, but had further tests performed after some time. These were already negative. Thus he evaded the duty to address the situation. When the client got to me, I found a **heavy** filaria burden. The same physician refused even to examine another client who had just returned from Italy, on the grounds that she had not been in an endemic region. But that is exactly what Italy is.*

So much for illustration of how you may not succeed even with well versed experts. Slovakia **does not have a single center** specialized in testing for filariasis, we have the **Bulovka Hospital** and the **Institute of Travel Medicine in Prague**.

A colleague with long-lasting eye problems went to two Prague centers and requested an examination for parasites. In both cases, the blood test for parasites was negative. At Bulovka, she even learned that she was suffering from parasitophobia. She then found on the web that it is possible to have the tests carried out in Switzerland for several thousands of crowns. She let a nurse take her blood samples and sent the samples to Switzerland. The result was surprising. The Swiss found antibodies to toxocara and filariae. This case needs no comment either.

Another method is the determination of **eosinophil count**:
I quote from **MUDr. František Stejskal, Tropical Medicine Ward of the Medical School of Charles University and Na Bulovce University Hospital:**
"Some parasitoses may be mild or asymptomatic. In such cases, the determination of **eosinophil** count per unit blood volume is often the only indicator of systemic **helminthoses**. (Eosinophils are white blood cells specialized in fighting against parasites in the body.)

THE NORMAL EOSINOPHIL COUNT in peripheral blood is 0 – 350/mm3

THE NORMAL COUNT IN BONE MARROW is 0.5 – 4% of metamyelocytes

EOSINOPHILIA is present if there is more than 500 eosinophils in 1 microliter of blood. If the eosionphil count exceeds 1,500/mm3 over more than six months, we speak of a **hypereosinophilic syndrome**. **No** protozoan infection will cause any significant eosinophilia.

Intestinal helminthoses in the luminal phase (in the intestine), such as **enterobiosis, ascariasis, trichuriasis, ancylostomiasis, and taeniasis**, usually **do not cause** eosinophilia. Typically, eosinophilia is associated with the migration of helminth adults or larvae through the host's tissues. In the acute phase, **eosinophilia** is greater, in the chronic phase it diminishes**; no eosinophilia at all may develop** with septic patients or immunodeficient people.

Another method is the determination of antibodies, mostly by **ELISA**, an enzyme-linked assay. Over the years spent in **EAV** testing, you are all sure to have met clients with whom you detected **borrelia**, but they told you that according to a medical examination they had either none or just a borderline or lower count. Each of us has hundreds of such cases in his or her practice. **The same test is used to measure parasite-specific antibodies!**

Lékařské listy 2008:
"Some patients do not develop any antibodies." **MUDr. Olga Ivanovna Jelisejeva** warns against relying on the detection of antibodies and says that as the civilization advances, the ability of the human body to make antibodies declines. German medical doctor **MUDr. Ingrid Fonk**, who has dealt with parasites for 30 years, writes the same thing.

I don't believe in this method since 2008 when our colleague was admitted into the Bohunice hospital. She told the doctors that she suspected tapeworm infestation because she had already been treated for it and the symptoms recurred. The doctors carried out tests for three days, collected stool, took blood samples, and found antibodies against toxocara. In effect, the colleague had **Taenia solium, alveococcus, Echinococcus granulosus, several kinds of liver fluke**, and, well … **toxocara** on top of that. A doctor assured my colleague that if she had had a tapeworm, antibodies would surely have revealed it. On return from the hospital, a 30 cm segmented body came out of my colleague. From that moment I am very skeptical about the accuracy of classical examination techniques, especially about antibody detection.

Immune system of even an adult individual often fails to produce antibodies to infections which it encountered during the intrauterine life, because it regards them as friendly.

The imperfection of the current examination techniques impedes the recognition of the true causes of diseases, where they begin, where is their foundation. Unfortunately, science builds its conclusions on such imperfect techniques. However, as the examination techniques go forward and become more and more detailed, the present conclusions are going to be refuted. We cannot let the current views, based only on the current imperfect knowledge, take control of us. We must see beyond the limit even if these techniques prevent us from proving many things we say and do. We can, however, anticipate them and even today develop methods which may resemble the beginnings of modern medicine. History tells us that practical results were oftentimes in advance of scientific research, and it was many years before the latter caught up with the former. .

I hope that I have disabused you from the naïve idea that you can rely with confidence on conventional tests. Referring to **practical results that will be in advance of science**, **I hope that Diary 1 and Diary 2 might convince you of that**.