

Fibromyalgia Syndrome and Heavy Metal Toxicity

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Introduction:

Fibromyalgia has found its firm place in the spectrum of pain disorders in the mid 1980s after Goldenberg¹ established the major criteria for diagnosis, which subsequently were further refined by the American College of Rheumatology². These include:

1. At least 11 of 18 specific tender points (in the absence of tenderness of other randomly chosen points) in 3 out of 5 possible body regions: 1. Left side of body 2. Right side 3. Above waist 4. Below waist 5. Axial skeleton - often combined with morning stiffness (78%)
2. Mild depression
3. Disturbed sleep (73%)
4. Fatigue (85%)
5. Increased inability to cope with life's normal chores
6. Absence of elevation of sedimentation rate
7. Absence of other demonstrable pathology

An estimated three to six million patients in the US are affected by FMS³. The goal of treatment has been to establish normal sleep cycles through the use of low dose sleeping medication to boost the body's level of serotonin, and reducing pain through either NSAIDS or complimentary modalities such as exercise, physical therapy, relaxation techniques, massage, and biofeedback³.

In recent years it has been more and more obvious that fibromyalgia is a syndrome, not a disease, with many possible underlying and/or contributing causes. Based on new concepts of the illness other names were suggested such as "Dysregulation Spectrum Syndrome" (DSS). ⁴

Amongst the causal factors discussed currently are the following:

1. Hormonal abnormalities - most common⁵:
 - a) Subclinical adrenal failure
 - b) Subclinical hypothyroidism
2. Nutritional causes (magnesium deficiency, deficiency of aminoacid-neuropeptide precursors etc.) ⁶

3. Systemic toxicity⁷ (petrochemicals, organophosphates and chlorines, heavy metals)
4. Psycho-emotional problems⁸ (unresolved conflicts, post-traumatic stress)
5. Structural problems (whiplash injury, craniosacral dysfunction, “osteopathic lesions”)
6. Environmental stress⁹ (underground water lines, electro-smog)
7. Idiopathic/genetic¹⁰

Heavy Metal Toxicity:

In most of today’s toxicological literature the term “heavy metal” is used interchangeably with the term “toxic metal”. In this paper we will discuss heavy metal toxicity as a common co-factor in FMS. The experience shared here was gained in running a multidisciplinary pain clinic from 1984 - 1996 (author D.K.). In addition to the standard intake interview and exam, careful attention was given to historical data suggesting toxic exposure in the past. Since the major source of mercury body burden (in patients that did not have professional exposure or extreme exposure from eating contaminated fish such as in Minamata, Japan) is from dental amalgam fillings^{11, 12}, we also used a dental questionnaire and dental evaluation in the standard work-up of our chronic pain population. The average amalgam filling contains 50% metallic mercury, which gradually is released from the filling over many years¹⁶. We also utilized dental panorama x-rays in every patient, assessing the number of root filled teeth, the number and size of radiolucent jawbone areas (infections or NICO lesions¹³ and the number and quality of dental fillings, onlays, crowns and bridges. It soon became clear, that there was a direct relationship between chronic pain syndromes and poor dental status. Recently a high correlation has been found between poor dental status and coronary heart disease in a study of 9760 US veterans¹⁴. Research at the University of Kentucky showed clearly that jaw bone infections and devitalized teeth contain toxins that are more noxious than hydrogen sulfide (H₂S) and lead to the destruction of at least 5 essential enzymes in the CNS¹⁵. Silver amalgam fillings give off substantial amounts of mercury vapor from the moment they are placed, which is absorbed to over 80 % by the mucous membranes of the oral cavity and lungs¹⁵. Mercury is lipophilic and has long been recognized as a potent neurotoxin¹⁷. It has been suggested as a possible cofactor in chronic pain syndromes for many years. From these reports it appeared reasonable to suspect, that some cases of FMS are caused by either infections in the oral cavity and/or by mercury toxicity. Other

metals are also known as neurotoxins, amongst them lead, cadmium and aluminum.

Diagnosis:

Lead toxicity can be diagnosed with a simple inexpensive test (hair analysis). Therefore it has been given more attention by researchers worldwide than the equally important toxicity from other metals. Aluminum, cadmium and mercury toxicity is clinically diagnosed today by using a “challenge test”: an appropriate complexing or chelating agent is given orally or injected intravenously followed by a 6 or 24 hour urine collection. The specimen is then examined in the laboratory for the presence of the metal in question¹⁸.

In the years 1990-1991 we examined 10 consecutive FMS patients. The diagnosis of FMS was made prior to referral to our clinic by physicians in the orthopedic/rheumatology community and confirmed by us using the criteria outlined above. We excluded hypothyroidism by using the following lab tests: free T3, free T4 and TSH. Hypoadrenia was ruled out by obtaining a 24-hour urine hormone panel or saliva panel. Patients with a significant motor vehicle accident or trauma history were excluded. 7 patients were women, 3 were men (average age of 44.2 years).

Method:

Initially each patient received an injection with DMPS (Di-Methyl-Sulfonyl-Methane), 3 mg/kg slow iv., followed by a 24-hour urine collection and analysis for toxic metals. DMPS is currently the safest complexing agent available with the widest range of applications. It is most effective for copper, zinc, arsenic, mercury, lead and cadmium. If the test showed high levels of a toxic metal, the same injection was given once a month and the progress monitored with a simple pain drawing and self rating of the patients condition: no improvement - moderate improvement - good improvement and resolution of pain condition.

DMPS was first introduced in Russia in the late 1960s as a further chemical development from BAL (British Anti Lewisite) and is used today in all Western countries (except the US, where no agent is listed in the PDR for this purpose) as the preferred agent to stimulate the excretion of mercury and lead. It is quite ineffective for aluminum toxicity. DMPS is FDA approved as a compounding agent to be used by custom compounding pharmacists for the use of individual patients in need for it.

We discontinued the injections, when

1. The patient had complete resolution of their FMS symptoms
2. With consecutive injections there was no further clinical improvement
3. All metals in the urinalysis dropped to normal levels.

Since normal levels for mercury were not known at the time, we established our limit at 4 micrograms of mercury per gram of urinary creatinine based on our clinical experience (we would often see clinical improvement, when levels dropped from above to below 4 micrograms of Hg/gram of creatinine. We rarely saw a clinical improvement when treating a patient who on consecutive injections had a level of 4 or less micrograms of mercury/gram of creatinine).

By comparing the results of the urine test with the information from the intake exam we tried to establish the possible source(s) of exposure to the metal(s) found.

To trace the exposure to toxic metals was not always easy: a zirconium toxic patient was working as a sales clerk in a suede-clothing store. Suede leather is made by exposing the leather to zirconium (in the old days mercury was used for this purpose) which starts to evaporate when the clothes are hung in a store or at home in the closet. The patient had to stop working in the store before her urine-levels began started to drop. The cadmium exposures we discovered were clearly linked to smoking and automobile exhaust. The aluminum toxicity was from the tap water the affected patient was drinking. Following the basic rule of toxicology “remove the source of exposure” each patient was asked to act on the findings and avoid further toxic exposure, no matter how difficult, expensive and inconvenient this may be.

If the patient had amalgam fillings a dentist skilled in the removal procedure removed them. The fillings were replaced by biocompatible metal free fillings and/or metal-free crown and bridgework.

Findings:

- Average number of root canal filled teeth/per patient: 2.4 (0-8)
- Average number of suspected jaw bone lesions (infections, NICO lesions, sclerosis): 4.3 (2-10)
- Average number of “silver fillings”: 7.6 (0-16). 2 patients had no silver fillings at the time of our intake exam, but had them for many years before they were removed. However, both showed extremely high levels of mercury in the initial test.

- Elevated urine levels for one (or more) toxic metal after initial challenge injection: 9 of 10 patients (some patients showed more than one toxic metal)
- Mercury: 7 of 10 (15-2900 micrograms of Hg/ gram of creatinine)
- Lead: 3 of 10
- Cadmium: 1 of 10
- Aluminum: 1 of 10
- Zirconium: 1 of 10

The one patient that did not have elevated metal levels decided to continue on the once/month DMPS regime, since she felt better after the first injection. On her 3rd treatment, she started to show significantly elevated mercury levels, which did not drop until after the 6th treatment.

Clinical results:

- All but one of the patients with FMS improved.
- Within 6 months 5 patients experienced complete disappearance of their symptoms.
- Three patients had “good“ improvement. Two of these patients had complete disappearance of their symptoms after removal of the root filled teeth, which was done between four and nine months after begin of treatment.
- One patient stayed completely unchanged during the initial observation period of six months but improved dramatically with continuation of the injections. Another patient felt quite ill after each DMPS injection (nausea, G.I. upset) and was switched to another complexing agent (DMSA, 10 mg /kg body weight in three divided doses, three days on, 11 days off). With this regime the patient had no significant side effects and improved to “good improvement” within seven months.
- One patient showed initially only elevated aluminum levels. He was treated with Desferal (500 mg, given once/month s.c.) for 4 months, before urinary mercury levels became elevated. At that time we switched to DMPS, which resolved the FMS symptoms within 5 months
- Average number of treatments to “good improvement”: seven.
- Average number of treatments for entire course: 11 (4-23).

Conclusion:

This small subgroup of FMS patients had a dramatic response to minimizing their exposure to toxic metals and reducing their toxic metal body burden. Since there is no healthy control group the results could not be compared statistically. This pilot study suggests however, that heavy metal toxicity should be considered as a possible cause or co-factor in fibromyalgia syndrome.

Outlook:

We suspected, that FMS in these patients is a reflection of heavy metal contamination of the limbic system and that FMS is a limbic system disorder, as suggested by other researchers **19**. However, when we performed trigger point injections in selected patients in an unpublished follow-up study using a mix of DMPS and procaine, we found clearly elevated levels of urinary metal excretion in the triggerpoint injected group as compared to the group only injected intravenously.

This suggests that in FMS not only the limbic system but also the muscle and connective tissue itself is toxic, and further research should be directed to this issue.

Many years have gone by since these early observations; hundreds of FMS patients have been treated with our approach. The results and conclusions presented in this paper have held up over time. Our approach has been modified however. Today we use autonomic response testing (ART) as a diagnostic procedure developed by one of the authors (D.K), which helps to predict non-invasively where in the body which metals are stored and which detoxifying agent would be most suitable for a particular patient or problem^{**20**}. We found that physical^{**21**} and/or emotional scars^{**22**} can be a significant handicap to detoxification. We also found that any degree of heavy metal contamination of connective tissue and the intracellular environment fosters the growth of microorganisms - viruses, bacteria, mycoplasmas and fungi. Simultaneous treatment of the infection results in faster and more complete metal detoxification and more rapid and complete resolution of symptoms ^{**23,24**}.

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