

## MULTIPLE SCLEROSIS AND AMALGAM

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### ABSTRACT

Amalgams is still used today as a restorative material. Due to mercury inside, amalgam used in restorative dental has always been the subject of debate. Studies have been performed on mercury in terms of nörotoksikoloji. However, the effects of mercury on the nervous system has not been clarified. Microleakage of mercury comes out of amalgam and this mercury can pass through the blood brain barrier. A portion of the authors in their study stated that microleakage of mercury can be tolerated; while others pointed out that microleakage of mercury can not be tolerated. However; mercury which penetrates the body is located in the etiology of diseases such as Alzheimer, chronic fatigue, and multiple sclerosis (MS). In this paper, it has been described that whether there is a relationship between MS and amalgam restorative materials.

**Keywords:** Amalgam, multiple sclerosis, nerve fibers, lymphocytes.

### Introduction

Multiple sclerosis (MS) is a disease that affects the central nervous system and the exact cause of it is unknown. Amalgam is a risk factor for MS [1,2]. Genetics and environmental factors are thought to involve autoimmune mechanisms and trigger MS [3]. MS is a neurological disorder that is more prevalent in young adults [4]. In epidemiological studies, it is thought that an immune system stimulates autoimmunity by initiating activation as a result of encountering with a specific or non-specific agent in an individual genetically predisposed to MS [5-6]. Most patients have deterioration in the position and vibration sense. Legs are more affected than arms. Increased muscle tone, abnormal stretch reflexes, generalized spasms are seen in patients suffering from Multiple Sclerosis. [7-10].

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Metals such as mercury and gold in experimental animals induce autoimmunity [11-14]. Mercury accelerates systemic autoimmunity in laboratory mice [15]. Some metals accelerated autoimmunity in humans [16]. Autoantibodies are increasing when exposure to high levels of inorganic mercury [17-19]. El-Fawai *et. al.*, in their study, noticed that myelin basic protein autoantibodies was significantly increased in workers who exposed to mercury when they compared the employees working in fluorescent factory and exposed to 0.05 mg/mm<sup>3</sup> mercury with the other employees who were not [17]. Patients with autoimmune disease were found to be allergic against heavy metal. In addition to mercury, gold, beryllium, and metals such as nickel has been found to cause allergic reactions [20,21].

### Discussion

In Australia, mortality rates due to MS were determined to have a direct correlation with the rotten, filled and drawn teeth [22]. In 1966 Bassch neurologist stated that amalgam fillings were a source of mercury and MS disease developed as a reaction allergic to amalgam

restorations [23]. Eggleston and Nylander examined mercury levels in brain tissue using 83 cadavers. As a result of their study, they found a positive correlation with the amalgam on occlusal surfaces. Thus, they stated the amalgam in oral region caused an accumulation of mercury in the brain [24].

In patients with MS, a reduction in the T-8 (CD8) receptors, one of the subset of T lymphocytes, is seen. Eggleston stated that amalgams suppressed T receptors and decreased T lymphocytes. Upon the removal of Amalgams from mouth, an increase in T lymphocytes was seen. [25] Another MS-related clinical opinion is that an increase in IgG antibodies occurs in the cerebrospinal fluid of patients with MS. Ig G provides defense against bacteria. Colorado State University showed that there is a direct correlation between IgG and urine mercury. As we mentioned earlier, mercury has been found to stimulate antibodies [26,27]. Similarly Koller, in his studies on rabbits, stated that mercury had a suppressive effect on immune against viruses [28].

The demyelization of nerve fibers is the pathological hallmark of MS. In the studies done, mercury has been found to cause nerve fibers demyelization. Nerve conduction velocity to be slow is another feature of MS. Chemically, in workers who exposed to inorganic mercury this case was found; however, after removal of mercury in MS patients showed significant increase in nerve conduction velocity [29,30,31]. Robert *et. al.*, in their studies, in MS patients with amalgam restorations, metallic taste, bad breath, loss of taste, teeth grinding was found at a high rate. After the removal of amalgam restorations, it has been seen that this oral symptom disappear [22].

### Conclusion

MS and amalgam relationship has been conducted in different studies. As a result of studies, amalgam fillings in patients with autoimmune disease can be inconvenient for taking out. Similarly, patients with such kinds of diseases had better change the amalgam restorations with different restorative materials. The determination of exact relationship between amalgam materials and Autoimmune diseases such as MS, whether they are able to tolerate the amalgam in oral region or not, and whether mercury micro leakage from amalgams damages tissue or not; these subjects are needed to be further searched.

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