



**INTRODUCTION**

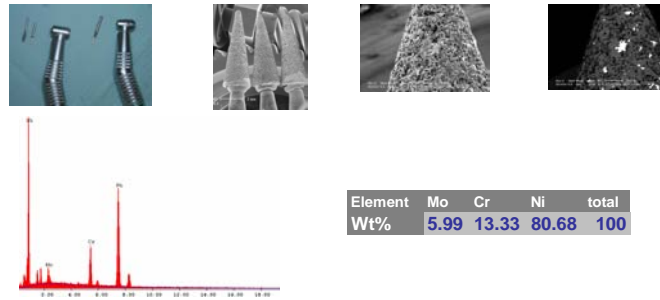
In dentistry and medicine many metal based materials are used as permanent 'medical device' in the human body. Many case reports are available on the possible side-effects of these medical devices on the patients' health. In dentistry only a few studies are published that reported systemic effects of dental materials. Therefore a clinical study was started to test the hypothesis that patients with auto-immune diseases will have a high prevalence of metal sensitization, which are related to the medical or dental devices the body.

**AIM**

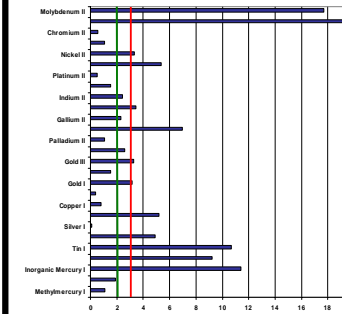
The aim of this study was to develop a diagnostic method to reveal possible sensitization of patients due to metal components present in their dental restorations.

**MATERIALS AND METHODS**

The test methodology was developed to reveal the composition of metal based restoratives. An alpine polishing stone in an angle-piece was used as a micro-sampling method. This method did not result in any structural damage of the restoration. The composition of the metal alloy remnants of the sample were analyzed by X-ray fluorescence spectrometry (EDAX) in a SEM. This results in a reliable estimation of the alloy composition with an accuracy of 1 wt%.



The immune response was determined by applying a specific Lymphocyte Transformation Test (LTT), MELISA® (MEmory Lymphocyte ImmunoStimulation Assay).



$$SI = \frac{\text{Test cpm}}{\text{Ave. Neg. control cpm}}$$

**SI ≥ 3 ⇒ Positive**

Valentine-Thon E and Schiwarz H-W. Validity of MELISA® for metal sensitivity testing. Neuroendocrinology Letters 2003; 24(1/2):57-64.

**RESULTS**

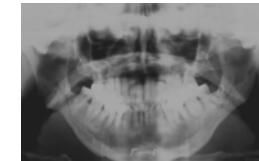
Using the micro-sampling method resulted in a 'road map' of the composition of the different metal based restorations of the patient. An immunologic screening of these specific metals was carried out. 104 patients referred to our Oral Diagnosis Clinic with complaints regarding allergic reactions to dental restorations, metal taste, dry mouth and chronic fatigue syndrome were tested. 79% of the patients were sensitized to one or more metal components of their dental restorations.

	Frequency	n	LTT+*	n
man	28,7%	30		
woman	71,3%	74		
total		104		
burning mouth	18,3%	19	78,9%	15
fatigued	25,0%	25	100,0%	25
skin diseases	8,7%	9	66,7%	6
metal taste	14,4%	15	80,0%	12
auto-immune disease	18,3%	19	100,0%	19
joint pain	15,4%	16	93,8%	15
nickel allergy	23,1%	24	87,5%	21
dry mouth	12,5%	13	84,6%	11
food allergy	13,5%	14	85,7%	12
intra-uterine spiral problem	8,7%	9	88,9%	8
breast implants	4,8%	5	80,0%	4
hay fever	5,8%	6	100,0%	6
amalgam restorations	56,7%	59	91,5%	54
intra-oral signs of corrosion	9,6%	10	100,0%	10

\* patients sensitized to 1 or more metal components of their dental restorations



An amalgam tattoo showed to be a reliable predictor of metal allergy



This patient showed to be sensitized for Mo. The metal wires were made of stainless steel containing Mo.



An example of copper cytotoxicity

**CONCLUSION**

From this non randomized population it was found that 79% of the patients showed a sensitization to one or more metals which were present in their dental restorations. As we studied a non randomized population no general conclusion can be made. The diagnostic method developed in this study method can be used for a systemic approach to study the relation between metals used in dentistry an possible health side effects.