

CONSTANZE OLMS¹
MARYAM
YAHIAOUI-DOKTOR²
TORSTEN
W. REMMERBACH³

¹ Department of Dental Prosthodontics and Materials Science, University of Leipzig, Germany

² Institute for Medical Informatics, Statistics and Epidemiology (IMISE), University of Leipzig, Germany

³ Section of Oral Medicine, Department of Head Medicine and Oral Health, University of Leipzig, Germany

CORRESPONDENCE

PD Dr. Constanze Olms, MME
Poliklinik für Zahnärztliche
Prothetik und Werkstoffkunde
Universität Leipzig
Liebigstraße 12
D-04103 Leipzig
Tel. 0341-9721365
Fax 0341-9721319
E-mail: constanze.olms@
medizin.uni-leipzig.de

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Contact allergies to dental materials

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SUMMARY

There is a lack of epidemiological data on allergies to dental materials. For example, in the recently published fifth German Oral Health Study (DMS V), no information was given on any common allergies or allergies to dental materials. The aim of the present observational study was therefore to determine the frequencies and symptoms of allergies to dental materials. A public consultation hour for allergies of the oral mucosa and material incompatibilities has been integrated in the Department of Dental Prosthodontics and Materials Science in Leipzig, where clinical patient data have systematically been collected since 2012. The objective mucosal findings and the patients' complaints are documented in detail in a specifically designed data sheet. This study included 86 subjects (83.7% women and 16.3% men) with oral symptoms of a contact allergy. The average

age was 63 years (24–86). The most common allergies were to metals, of which nickel and cobalt were the most common allergens. Furthermore, many allergies were indicated to ingredients of cosmetics and composites. Allergies to components in methacrylate-containing denture resins came in at rank 5. 52.4% of the patients showed mucosal changes. Contact stomatitis (54.5%) and an oral lichenoid lesion (20.5%) were most frequently diagnosed. 86% of the patients reported subjective complaints. Pain and burning sensations in the mouth were mostly reported. Appropriate dental allergy history, clinical examination of the oral cavity for changes in the oral mucosa, analysis of specific dentures, and screening for psychogenic disorders are necessary to clarify the origin of these symptoms.

Introduction

In the German population, the number of allergies has been growing continuously for years. According to the WHO, the number of allergy sufferers rose from 3% to 30% between 1960 and 1995. In the 2013 study on Adult Health in Germany (DEGSI), nearly 20% of respondents reported an allergic disease during the last twelve months. The most common allergic diseases were hay fever (14.8%), bronchial asthma (8.6%) and contact dermatitis (8.1%) (LANGEN ET AL. 2013). Allergic contact dermatitis has thus reached an alarming frequency similar to that of diabetes mellitus (BRASCH ET AL. 2014). The introduction of new materials into dentistry also increased the likelihood of an allergic intolerance reaction as a result of dental treatment (STOLL 2007).

The diagnosis of allergies with oral symptoms caused by dental materials requires extensive expertise. In dental treatment, the type IV reaction, the cellular-mediated delayed reaction or

late reaction in relation to dental materials, is particularly relevant (HEMPRICH & REMMERBACH 2008). As a standard diagnostic method for the detection of such a contact allergy a patch test is used, with standardized test substances. Nevertheless, due to false-negative or false-positive documented reactions, a clear diagnosis is difficult. Other potential sources for errors are, missing or incomplete information about the ingredients of dental materials, as well as about their potential release in the intraoral environment. Through permanent contact with the mucosa, substances deposits can accumulate and trigger incompatibility reactions. Conversely, despite a positive test reaction on the skin, clinical compatibility may also be possible due to the anatomical, functional and immunological features of the oral mucosa.

There is a lack of current epidemiological data on allergies to dental materials. For example, in the recently published fifth

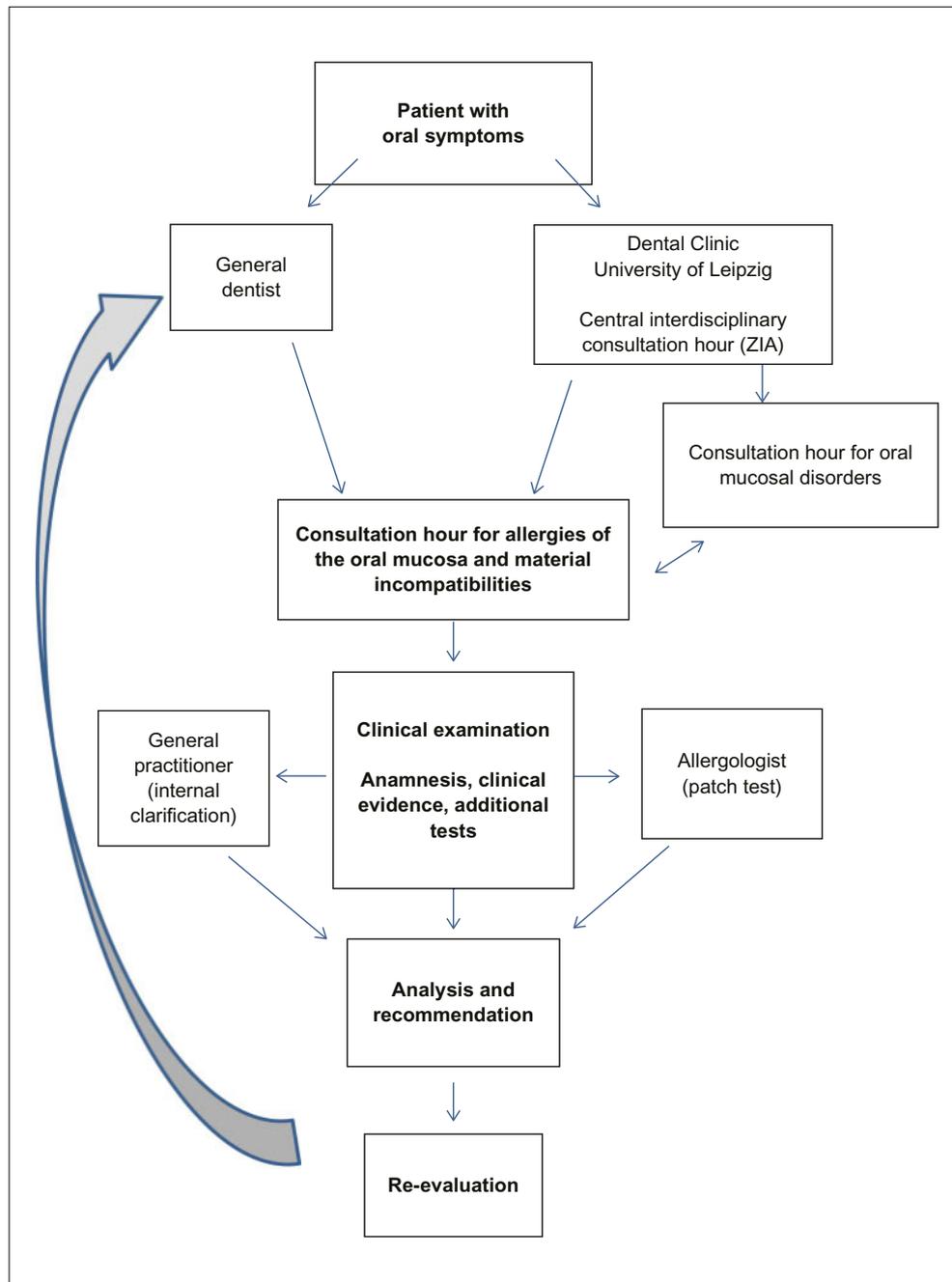


Fig.1 Flow-chart of consultation hour for allergies of the oral mucosa and material incompatibilities

German Oral Health Study (DMS V), no informations were given on any common allergies or allergies to dental materials (JORDAN & MICHEELIS 2016). The aim of the present observational study was therefore to determine the frequencies and symptoms of allergies to dental materials (dental allergies).

Material and methods

The study was proven by the Ethics Committee Leipzig and is listed under the reference 063/17-ek. The principles outlined in the Declaration of Helsinki in its latest version from the 64th WMA general meeting in October 2013 in Fortaleza (Brazil) were followed (WORLD MEDICAL ASSOCIATION 2013).

The consultation hour for allergies of the oral mucosa and material incompatibilities is integrated in the Department of Dental Prosthodontics and Materials Science (Fig. 1). Since 2012, clinical patient data have systematically been collected. The objective mucosal findings and the subjective complaints are documented in detail in the patient file.

The intraoral inspection was performed by one prosthetic specialist with specialized expertise and experience in relevant oral allergy symptoms. In interdisciplinary cooperation with the section of Oral Medicine oral findings were clearly clarified and diagnosed.

The anonymized data collection for this work spanned four years, May 2012 to May 2016. In addition to the collection of personal data (age, sex, place of residence, occupation and referral status), general medical history (Tab. I) and a history of allergies were collected. This contained the individual sensitizations after a patch test and the dental materials of the dental prosthesis used in detail. Furthermore, the objective symptoms of the patients were recorded. The clinical examination included the detailed dental status and also the inspection of the entire oral cavity. Particular attention was paid to mucosal changes in the area of contact with dental materials. Relevant mucosal findings have been extensively documented.

For the data collection a newly designed "Allergy questionnaire" was developed. The questionnaire mostly dealt with the collection of allergen-specific data. These included the information in Table II on the available dentures' allergen-specific items (Tab. III).

The data of patients over the age of 18 with allergic complaints related to dental materials were included in the statistical evaluation only. Excluded were patients who were dissatisfied with their dentures or who could not cope, as well as patients who developed symptoms due to toxic, mechanical or microbiological stimuli.

The anonymized data was divided into the following categories: dental status, medical history, allergen-specific data, objective symptoms and subjective symptoms.

The statistical evaluation was done descriptively with the program SPSS 23.0 (SPSS Inc., Chicago, IL, USA). Clinical observations between the parameters general diseases and allergies as well as objective and subjective symptoms were summarized.

Results

The study included 86 subjects with oral symptoms of a contact allergy. There were 72 (83.7%) women and 14 (16.3%) men. The average age was 63.1 years (min = 24 years, max = 86 years). In terms of occupation, 50% were retired, 32.6% employed and 5.8% did not work. 10.5% stated "not specified".

Tab. I Items of the general medical history

General diseases	Cardiovascular diseases
	Blood disorders
	Thyroid disease
	Infectious diseases
	Diabetes
	Autoimmune diseases
	Lung disease
	Diseases of the internal organs
	Neurological diseases
	Fungal infections
	Other diseases

Tab. II Allergen-specific items

Allergy test	Patch test
	Prick test
Allergy document	Allergen
Allergies/ intolerance	Local anesthetics
	Antibiotics
	Latex
	Amalgam
	Gold
	Other metals
	Plastic
	Composites
	Ceramic
	Food
	House dust
	Animal hair
	Plants/grasses
	Other, unspecified allergies (e.g., solvents, etc.)

Tab. III Details of the existing dentures

Details of dentures	Fillings
	Inlays
	Crowns
	Bridges
	Implants
	Partial dentures
	Complete dentures

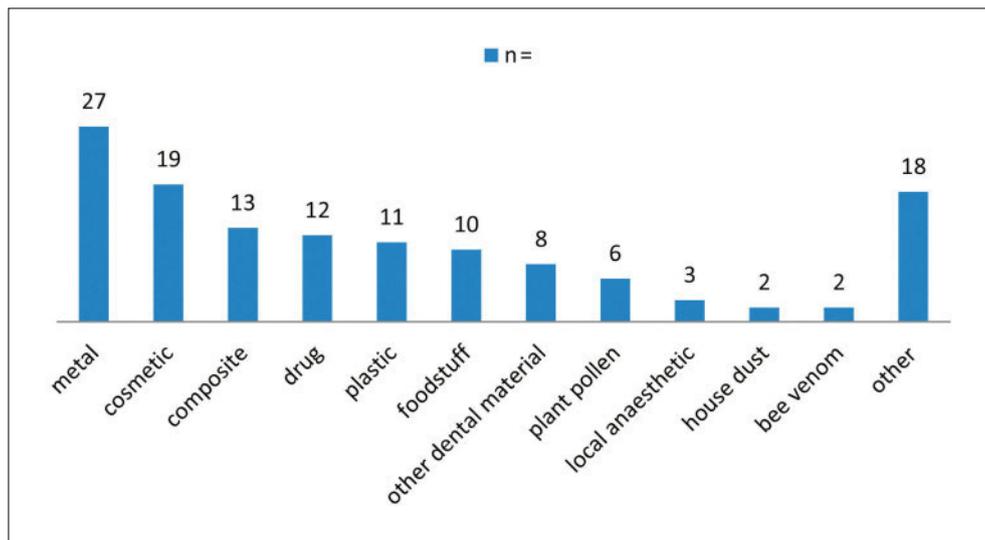


Fig. 2 Frequency of occurrence of allergens

Information on dental status and dentures

The status of the teeth was completely recorded of 84 patients. Two patients refused a dental-clinical examination. Only 2% (n = 2) were toothless in both jaws. 82.6% (n = 71) were partially toothed and 12.8% (n = 11) fully toothed. 62% (n = 52) of the patients had a fixed or removable denture. Of these, 63.5% (n = 33) were treated with a purely fixed denture. Nine patients were treated with crowns and bridges. Eleven patients wore a partial as well as a complete denture.

Evaluation of the data from the medical history

The evaluation of the medical history sheet showed the following frequency distribution: with 48.8% (n = 42) cardiovascular diseases were most frequently observed, followed by thyroid disorders 32.6% (n = 28), respiratory diseases 14% (n = 12), neurological disorders 10.5% (n = 9), anxiety and depression 9.3% (n = 8), blood disorders 8, 1% (n = 7), diabetes 7% (n = 6), autoimmune diseases 5.8% (n = 5), skin diseases 4.7% (n = 4) and

infectious diseases 2.3% (n = 2). 30.2% (n = 26) of the patients reported other disorders.

Looking at the percentage distribution, for women, in addition to the already known allergies, cardiovascular diseases and thyroid diseases are the most frequently represented. For men, allergies, cardiovascular diseases and respiratory diseases are at the forefront.

Of the 42 patients with a cardiovascular disease, 71.4% (n = 30/42) took the appropriate medication. Of the patients with a thyroid disease, 20 patients, representing 71.4%, took thyroid hormone preparations. In total, 15.1% (n = 13) of the patients reported taking antidepressants in the past.

Evaluation of allergen-specific data

60.5% (n = 52) of the patients reported at least one allergy at the first visit presentation (Fig. 2). On average, the patients suffered from 5.3 ± 4.6 allergies (min = 1, max = 20). Most of the allergies were to metals, of which nickel and cobalt were the most common (Fig. 3). Furthermore, allergies to ingredients of cosmetics and composites were indicated. Allergies to components in methacrylate-containing denture resins came in at rank 5. Allergies to local anesthetics were reported by three patients.

Among dental materials, incompatibilities with toothpastes, fluoride gels, eugenol, ceramics and polyamides (nylon) were reported.

In total, 35% (n = 18/52) of the patients reported a nickel allergy. At the same time, ten had a cobalt allergy, five a palladium allergy and four an amalgam allergy.

Evaluation of the data from the clinical examination (objective symptoms)

A systematic visual inspection of the oral mucosa was performed. Over half (52.4% / n = 44) of the patients had mucosal changes. Contact stomatitis (CS) (54.5% / n = 24) and an oral lichenoid lesion (OLL) (20.5% / n = 9) were most frequently diagnosed (Fig. 4 and 5). In two cases contact dermatitis (CD) could be observed in addition to CS. Oral lichen planus (OLP) and leukoplakia were detected in three and two cases, respectively (Fig. 6). Redness of the gingival margin, recurrent aphthae, lingua plicata, and redness/swelling of the incisive papilla have been grouped under other diagnoses.

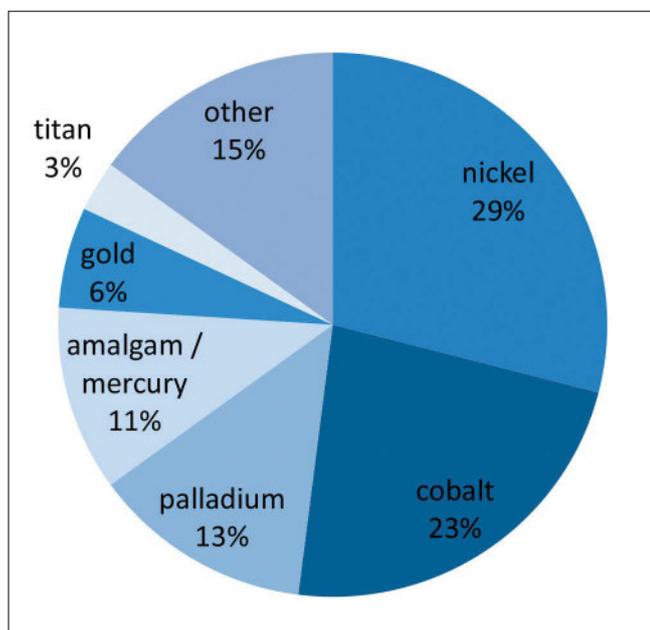


Fig. 3 Distribution of metal allergens



Fig. 4 Patient with contact stomatitis and methacrylates allergy

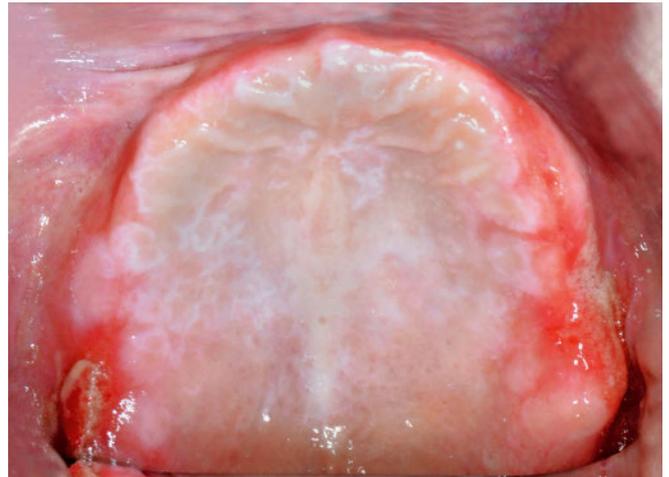


Fig. 6 Patient with oral lichen planus and methacrylates allergy

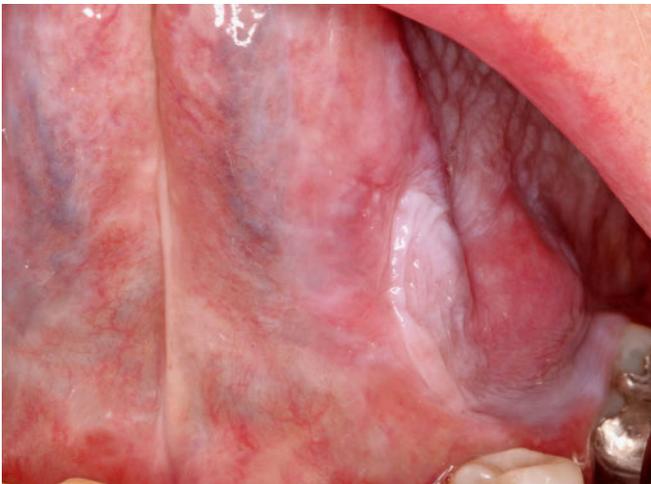


Fig. 5 Patient with oral lichenoid lesion (lateral side of the tongue) and mercury allergy

Evaluation of the data of subjective symptoms

86% (n = 72/84) of the patients reported subjective complaints. About one-third (33.3% n = 28/84) reported burning in the mouth. With 75% the burning was localized on the tongue and the palate, with 29% (n = 8/28) it occurred on the palate, with 25% (n = 7/28) on the tongue, and 25% (n = 7/28) reported a general burning in the mouth.

About 24% (n = 20/84) experienced pain in the oral mucosa and about 18% (n = 15/84) inflammation. In six cases (7%) taste impairments were observed.

Discussion

Based on the data in our study it seems that patients who develop oral intolerance are often older, predominantly female patients with a long-term dental history. Patients with allergic complaints or material intolerances often have a long dental history. Informations on any existing dentures and the materials used are helpful for a clinical diagnosis. Patients with objective and subjective symptoms of contact allergies to dental materials should not be exposed to allergens. We recommend that in daily clinical practice dental professionals pay more attention to symptoms of contact allergy and allergy in the patient's history. It is the dentist's responsibility to choose which materials and combinations of materials to use. Detailed medical and

dental history and material knowledge are crucial in preventing sensitization of individual material components and side effects. The appropriate material cannot be chosen by dentists and/or allergists alone, because both groups do not know all the component ingredients in dental materials and, more importantly, which ingredients may actually be released in the oral cavity (REICHL ET AL. 2012; SEVKUSIC ET AL. 2014; HOGG ET AL. 2016). The manufacturer's safety data sheet does not usually show all ingredients in their product (dental materials).

Frequency of contact allergies of dental materials

During their lifetime about one third of the adults living in Germany get at least one allergy. Most of these are hay fever, bronchial asthma and contact dermatitis. Females are affected more frequently than men, with the exception of atopic dermatitis. 12.7% of women and only 3.4% of men suffer from contact dermatitis. This difference was visible in the study of adult health in Germany (DEGS1) in all age groups. Differences in the choice of profession but also the increased contact to costume jewelry, cosmetics or fragrances have been discussed as causes (LANGEN ET AL. 2013).

In the present study, female sex dominated for adverse reactions to dental materials. This is also shown in the study by Vamnes et al., where 70% (n = 208/296) of those affected were women (VAMNES ET AL. 2004). Richter and Geier showed that in the stomatitis patients and in those who were tested for the clarification of a denture incompatibility, the female patients and altogether the older patients predominated (RICHTER & GEIER 1996). Also in the present study a high average age (63 years) was observed.

Contact allergy has often been preceded by sensitization to the skin, where it is often located on the hands. Not infrequently, occupational exposures also play a role in allergies. The most common contact allergen described is nickel (RING ET AL. 2000). About 13% of the population show sensitization to nickel, up to 3% to cobalt and about 1% to chromium (SCHÄFER ET AL. 2001; 2001). Nickel was also the most common allergen in the present study. In the study by Spiechowicz et al. ten subjects who had a recurrent hypersensitive skin reaction to nickel were fitted with restorations (crowns, bridges) containing 66% nickel alloy and controlled for over 40 months (SPIECHOWICZ ET AL. 1984). Only in one case did a more intense skin reaction to nickel occur in the patch test. Otherwise, no clinical changes were observed intra-

orally and extraorally. Mucosal biopsies also showed no allergic-inflammatory reactions. In one case, after the insertion of four single crowns, there was even an improvement in the eczema of the hands and forearms (SPIECHOWICZ ET AL. 1984). The meta-analysis by Gözl et al. showed that patients treated with nickel-containing orthodontic appliances in children and adolescents even had a lower risk of subsequent nickel sensitization (GÖLZ ET AL. 2015).

In the review by Sieber and Olms, nickel, palladium and mercury were identified as the most common allergens of a contact allergy (SIEBER & OLMS 2014). In the present study sensitizations/allergies to cobalt were most frequent with 23% of total metal allergens. For reasons of cost, cobalt-chromium-based metal alloys (base metal) are currently used in crown and bridge technology and in model casting in particular. This could be a reason for the increase. A sensitization via already existing contact with CoCrMo containing restorations cannot be excluded.

Allergies to mercury are reported in the literature at an average of only about 13% (SIEBER & OLMS 2014). In the present study, a frequency of 11% was observed for amalgam/mercury. The uncertainty about amalgam in the 1990s has meant that since 1992, indication restrictions exist. Generally considered harmful to the general public, it has since been used less and less as a restorative material.

In the present study, one case of titanium allergy was seen: In the patch test, a positive reaction to titanium dioxide was observed. According to Thomas et al., there are no exact test options for suspected titanium allergy. The patch test as well as the lymphocyte transformation test (LTT) are not meaningful in the determination of a titanium allergy and one speaks rather of a “tolerance/compatibility” (THOMAS ET AL. 2017).

A correlation between metal sensitization and inserted orthopedic implants has been reported in the literature (GRANCHI ET AL. 2008; MITCHELSON ET AL. 2015; WAWRZYNSKI ET AL. 2017). These implants have a close chemical relationship with dental alloys (CoCrMo alloys, stainless steels, titanium). The bone cement components MMA, DBPO, HEMA or hydroquinone are also identical to the ingredients of denture resins and composites. Allergies to these components can cause eczema, wound healing disorders, persistent swelling and aseptic implant loosening (THOMAS 2007). Every year, more than 200,000 joint replacement prostheses, especially hip and knee endoprostheses, and osteosynthesis materials are implanted. The extent to which an orthopedic joint replacement or a dental restoration may be a contact path for initial sensitization should be analyzed in the future.

The tooth-colored filling materials, the composites, have come into broad media focus. In recent years, the steady development and use of composites has also allowed for a growing number of intolerances and allergies to the constituents of these materials (ALANKO ET AL. 1996). So far, there is a lack of up-to-date data on whether an increase in allergies is related to the constituent parts of composites. The present study showed that sensitization/allergies to metals and composites were the most prevalent. The study by Mjör et al. from Norway showed that composite restoratives are increasingly being used (MJÖR ET AL. 1999). Lygre et al. reported only a few patients with reactions to resin (LYGRE ET AL. 2003).

Allergies to methacrylates were only observed in 8% of the population in the present study. An allergic contact sensitization to ingredients of denture plastics is, according to Gebhardt et al. rare. Nevertheless, there are cases of true allergic

stomatitis with positive patch testing (GEBHARDT ET AL. 1995, 1996; GEBHART & GEIER 1996). The study of Gebhardt et al. showed 1.8% allergy to MMA (meth methacrylate) and 5.1% to DBPO (dibenzoylperoxid) in testing patients (GEBHART & GEIER 1996). In a study by Stoll, a positive test result of 1.2% for MMA was shown (STOLL 2007). According to Schmalz and Arenholt-Bindslev, the frequency of such reactions in patients is only in the per mill range (SCHMALZ & ARENHOLT-BINDSLEV 2005). An allergic release in the patient by stabilizers such as hydroquinone reaches a value of 0.7%. For dental technicians and dentists, however, the risk of allergy is higher, at 9.5% for MMA and 9.8% for DBPO (GEBHARDT ET AL. 1996). Although MMA has very low systemic toxicity, local toxicity is significantly higher.

In the present study, in addition to an allergy to composites, patients also had sensitizations to methacrylates and vice versa. In animal experiments, after sensitization with MMA, cross-sensitization to other methacrylates could be detected (CHUNG & GILES 1977A, 1977B). In vitro, in the leucocyte migration inhibition test, MMA as a specific antigen elicited cellular immunity, with the immune response being concentration independent (ZAFIROPOULOS ET AL. 1985). It has been described in the literature that nail varnishes, as well as substances in artificial fingernails based on acrylates, have led to allergic reactions (MACEDO ET AL. 1995; JUNG ET AL. 2005; LAZAROV 2007). In this context one can speak of cross-allergies between different acrylates (GEURTSSEN 2005). The studies by Kanerva et al. show that, among other things, cross-reactions to different acrylates may occur in patch tests of patients with a suspected allergy using a comprehensive methacrylate test series (KANERVA ET AL. 1986, 1989). Chemical related materials always pose a risk of over-sensitization or allergic reactions.

Allergies to the ingredients of local anesthetics (primary and/or preservatives) were very rare in the present study. Nevertheless, they have a high priority as dental pharmaceuticals. In most cases, an allergic reaction (type I) occurs immediately after injection. If an allergic complication is suspected in local anesthesia, a clarification by the allergist is mandatory.

Other possible allergens in dental materials are eugenol, ceramics or polyamides, which have been observed to be allergens in the present patient population. In this study, one woman, 59 years old, with multiple allergies including MMA, claimed to have an allergy to nylon (as tights' material). An intraoral test with a test specimen made of polyamide led after about ten minutes to a clinical reaction with prickle and redness of the oral mucosa, as well as a swelling of the lips. In contrast the material vinyl chloride was well tolerated by the patient. So far, there are no reports in the literature that have described oral intolerance to polyamide.

Objective and subjective oral symptoms

In the literature certain subjective and/or objective symptoms are associated with an allergy to dental materials. These may be confined to the intraoral and orofacial region or occur in the whole body. Contact allergy can be caused by clinical symptoms such as redness and edematous swelling of the mucosa (KAPPERT & EICHNER 2008). The surface can shine and appear smooth, with ulcers in pronounced allergic reactions. Unspecific symptoms are soreness, pain, paresthesia, and taste change in the mouth area (OLMS & YAHIAOUI-DOKTOR 2018).

In the present study, more than half (52.4%, n = 44/84) of the patients had mucosal changes. Contact stomatitis (CS) was

most commonly diagnosed (54.5%, n = 24/44), followed by an oral lichenoid lesion (OLL) (20.5%, n = 9/44). The oral lichen planus (OLP) and the leukoplakia occurred only occasionally. A correlation between the objective mucosal symptoms and a specific allergen was not observed.

In the literature, symptoms such as lichen, contact dermatitis, contact stomatitis and burning mouth have been documented many times (SIEBER & OLMS 2014; OLMS & REMMERBACH 2017; OLMS & YAHIAOUI-DOKTOR 2018). It should be noted, however, that the published studies do not always differentiate clearly between an OLP and an OLL and only speak of the diagnosis "lichen". In the study by Raap et al., 32% (n = 9) of the patients with contact allergy to dental metals (n = 28) had oral lichen planus. The diagnosis was clinically and histologically verified and contact stomatitis was diagnosed in 29% (n = 8) of the patients (RAAP ET AL. 2009). In the present study, recurrent aphthae were associated with amalgam allergy in one case. The study by Raap et al. also observed recurrent aphthae with respect to contact allergies on dental metals (RAAP ET AL. 2009).

Current DMS V data on mucosal changes show that in the "younger adult" age group (35–45 years / n = 966) no carcinomas, erythroplakia, lichen planus, candida, smoker's keratosis and prosthesis-related changes occurred. About 1.9% of those examined were diagnosed with leukoplakia. Here the proportion of males compared to females was slightly increased. In the "younger seniors" age group (64–74 years / n = 1,042), 0.7% developed leukoplakia, 0.2% lichen planus, 0.1% candida, and 0.1% smoker's keratosis, and in 4.6% prosthesis-related changes were observed. When comparing the age groups, changes in the oral mucosa are more common in the younger elderly than in the younger adults. The cause was the prolonged contact with noxa e.g. nicotine or prosthetic dentures (REICHART 1999, BESSEL 2005). Whether this could also be allergy-induced mucosal reactions, is not apparent from the DMS V. Information on allergies or contact allergies to dental materials was not listed in the DMS V (JORDAN & MICHEELIS 2016).

In the present study, about one third (33.3% / n = 28) reported burning in the mouth. Of these, an isolated tongue burn (glossodynia) was observed in 25%. About 24% (n = 20) experienced pain in the oral mucosa. At 7% (n = 6) taste impairments occurred. In Raap et al., 14.3% (n = 4) reported a burning tongue and 11% (n = 3) a burning of the entire oral cavity (RAAP ET AL. 2009). In the literature, burning is often associated with an allergy (as a trigger). On the other hand, Heppt and Bachert see burning of the oral mucosa rather atypical of an allergic reaction and consider hormonal or metabolic factors as a possible cause (HEPPT & BACHERT 2010).

In case of general burning of the mouth, a differential diagnosis must also be excluded, such as a burning mouth syndrome (BMS). The study by Dal Sacco et al. dealt with the connection between contact allergies and BMS. In 38 patients with BMS a patch test was performed with standard series and special dental test substances (plastics, metals). 42.1% (n = 16/38) tested positive. In 21.1% (n = 8/38), a clinical relation of the test allergen with the oral symptoms could be found. Most frequently (n = 4), dental metals were identified as the cause (DAL SACCO ET AL. 2005). The study by Lamey and Lamb examined 150 patients with BMS. An allergy to polymethacrylates was detected at 7.3% (n = 11/150) (LAMEY & LAMB 1988).

In case of a burning mouth, in addition to BMS other differential diagnosis should also be considered, such as a vitamin B or iron deficiency. Similarly, Sjögren syndrome, candidiasis

or diabetes mellitus can cause this symptom. For example, tongue burns are frequently observed in women with climacteric symptoms, and signs of mild depression, insomnia, and other emotional problems are not uncommon (LAMEY ET AL. 1994; BORK ET AL. 2008).

In the multicenter study by Muris et al., 10.2% (n = 91/906) of the allergy patients had oral symptoms and complaints (MURIS ET AL. 2015). These patients showed significantly higher sensitization to palladium and nickel. Dry mouth (xerostomia) and metallic taste were strongly associated with palladium and nickel sensitization. Metallic taste was observed on nickel sensitization and the presence of metal crowns. On the other hand, the symptoms of burning mouth and pain, as well as stomatitis and oral lichenoid lesions were not associated with sensitization of nickel and palladium (MURIS ET AL. 2015). Dry mouth occurred with simultaneous palladium and nickel sensitization and in the presence of metal crowns. The cause was a lack of saliva. A lack of saliva can promote corrosion processes. In addition, saliva has an important washing effect. It also contains mucins that bind to the epithelial surface, secreted immunoglobulins A (IgA), and antiviral lysozymes, which can complicate the attachment of microorganisms (NEUTRA & KOZLOWSKI 2006; NOVAK ET AL. 2008).

The diagnosis of oral complaints suspected to be connected to the use of dental materials remains a challenge. It is important for the dentist to differentiate with purely subjective symptoms, whether it is more of a somatoform disorder or an allergy of dental materials. Appropriate dental allergy history, clinical examination of the oral cavity for changes in the oral mucosa, analysis of specific dentures, and screening for psychogenic disorders are necessary to fully clarify the symptoms. At this point it should be emphasized that patients with changes of mucosa should be respected to allergen-triggered oral mucosal lesions such as oral lichen planus, and the oral lichenoid lesion. In the literature, contact allergy to metals is also seen as an additional risk factor for the development of intraoral carcinoma (HOUGEIR ET AL. 2006). The study by Weber et al. showed an approximately 1.57-fold increase in metal allergy in patients with oral squamous cell carcinoma (WEBER ET AL. 2012).

Our study has some limitations. The number of participants is not so high and they may not be representative of the general population. There was no comparable control group available.

Conclusions

Theoretically, sensitizations and allergies can occur to any ingredient in dental materials. Not least, it is important for the dentist to know potential allergens in the dental materials and to advise and care for the patients accordingly. In clinical diagnostics, general dysfunctions on dental materials must be causally clarified. It should be emphasized that uniform standardized procedures in the allergy diagnostics of dental allergies are to be established interdisciplinary between the allergist and the dentist. Medically justified indications, as well as a critically founded test interpretation are to be aimed for in the future.

Dental materials are among the most common artificial materials that are incorporated into the human body. It is the dentist's responsibility to choose which materials and combinations of materials to use. The manufacturing process and the intraoral processing should be conscientiously and carefully coordinated. The detailed history of the patient and material knowledge are crucial to avoid side effects and sensitization of individual material components.

Zusammenfassung

Einleitung

Die Diagnostik von Allergien mit oralen Symptomen, bei denen dentale Materialien als Ursache angenommen werden, setzt ein umfangreiches Fachwissen voraus. In der zahnärztlichen Behandlung spielt vor allem die Reaktion des Typs IV, die zellulär vermittelte verzögerte Reaktion oder Spätreaktion, eine Rolle. Als Standarddiagnoseverfahren für den Nachweis einer solchen Kontaktallergie wird der Epikutantest mit standardisierten Testsubstanzen angewendet. Aktuelle epidemiologische Daten in Deutschland zu Allergien in Bezug auf Dentalmaterialien fehlen. In der kürzlich veröffentlichten fünften deutschen Mundgesundheitsstudie (DMS V) wurden keine Informationen zu bekannten Allergien oder Allergien auf Dentalmaterialien erhoben. Ziel der vorliegenden Studie war es deshalb, die Häufigkeiten und Symptome von Allergien auf Dentalmaterialien im Rahmen einer Beobachtungsstudie zu ermitteln.

Material und Methoden

Die Sprechstunde für Allergien der Mundschleimhaut und Materialunverträglichkeiten ist in der Poliklinik für Zahnärztliche Prothetik und Werkstoffkunde integriert. Seit 2012 werden die klinischen Patientendaten systematisch erhoben und die objektiven Schleimhautbefunde sowie die subjektiven Beschwerden dokumentiert. Die hier vorgestellte Studie umfasste 86 Probanden (83,7% Frauen und 16,3% Männer) mit oralen Symptomen einer Kontaktallergie. Das Durchschnittsalter betrug 63 Jahre (24–86).

Resultate

Am häufigsten kamen Allergien auf Metalle vor, wobei Nickel und Kobalt die häufigsten Allergene waren. Darüber hinaus traten Allergien auf Inhaltsstoffe von Kosmetika und Composite auf. Die Allergien auf methacrylathaltige Prothesenkunststoffe kamen auf Rang 5. Bei drei Patienten wurden Allergien gegen Lokalanästhetika festgestellt. Insgesamt traten bei 52,4% der Patienten Schleimhautveränderungen auf. Am häufigsten wurden Kontaktstomatiden (54,5%) und orale lichenoidale Läsionen (20,5%) diagnostiziert. 86% berichteten von subjektiven Beschwerden, ein Drittel (33,3%) von Brennen im Mund.

Diskussion

Etwa ein Drittel der in Deutschland lebenden Erwachsenen erkranken im Laufe ihres Lebens an mindestens einer Allergie. Das weibliche Geschlecht ist häufiger davon betroffen als das männliche. Theoretisch können Sensibilisierungen und Allergien hinsichtlich jeglicher Inhaltsstoffe in Dentalmaterialien auftreten. Nicht zuletzt ist es für den Zahnarzt von Bedeutung, potenzielle Allergene in den Dentalwerkstoffen zu kennen und die Patienten entsprechend beraten und betreuen zu können. In der klinischen Diagnostik müssen allgemeine Befindlichkeitsstörungen im Zusammenhang mit Dentalwerkstoffen kausal abgeklärt werden. Es ist besonders hervorzuheben, dass einheitliche standardisierte Vorgehensweisen in der Diagnostik von Dentalallergien interdisziplinär zwischen Allergologen und Zahnarzt zu etablieren sind. Eine medizinische begründete Indikation sowie eine kritische fundierte Testinterpretation sind zukünftig anzustreben.

Résumé

Introduction

Le diagnostic d'allergies avec symptômes buccaux supposant l'utilisation de matériaux dentaires nécessite une expertise considérable. Dans le traitement dentaire, c'est surtout la réaction de type IV de la réaction retardée ou tardive à médiation cellulaire qui joue un rôle. En tant que méthode de diagnostic standard pour la détection d'une telle allergie de contact, le test épicutané est utilisé avec des substances test normalisées. Les données épidémiologiques actuelles sur les allergies aux matériaux dentaires manquent. La cinquième étude allemande sur la santé bucco-dentaire récemment publiée (DMS V) n'a pas fourni d'informations sur les allergies connues ou les allergies aux matériaux dentaires en particulier. Le but de la présente étude était de déterminer les fréquences et les symptômes d'allergies aux matériaux dentaires.

Matériels et méthodes

La consultation pour les allergies de la muqueuse buccale et les incompatibilités de matériel est intégrée dans notre policlinique pour la prothèse dentaire et la science des matériaux. Depuis 2012, des données cliniques sur les patients ont été systématiquement collectées et les résultats objectifs de la muqueuse et les plaintes subjectives ont été documentés. Cette étude a inclus 86 sujets (83,7% de femmes et 16,3% d'hommes) avec des symptômes oraux d'allergie de contact. L'âge moyen était de 63 ans (24–86 ans).

Résultats

Les allergies les plus fréquentes étaient rapportées concernant les métaux. Parmi ceux-ci, le nickel et le cobalt étaient les allergènes les plus courants. En outre, des allergies ont été rapportées sur les ingrédients des cosmétiques et des composites. Les allergies aux résines de prothèses dentaires méthacryliques se classent au 5^e rang et une allergie aux anesthésiques locaux a été rapportée chez trois patients. Dans l'ensemble, 52,4% des patients avaient des changements de la muqueuse. La stomatite de contact (54,5%) et une lésion lichénoïde buccale (20,5%) ont été diagnostiquées le plus souvent. 86% ont signalé des plaintes subjectives. Environ un tiers (33,3%) ont signalé une sensation de brûlure dans la bouche.

Discussion

Environ un tiers des adultes vivant en Allemagne contractent au moins une allergie au cours de leur vie. Le sexe féminin est touché plus fréquemment que le sexe masculin. Théoriquement, tous les ingrédients des matériaux dentaires peuvent provoquer des allergies et des sensibilisations. En particulier, il est important que le dentiste connaisse les éventuels allergènes contenus dans les matériaux dentaires et conseille et soigne les patients en conséquence. Dans les diagnostics cliniques, les dysfonctionnements généraux des matériaux dentaires doivent être résolus de manière causale. Il convient de souligner que des procédures normalisées uniformes dans le diagnostic des allergies dentaires doivent être mises en place de manière interdisciplinaire entre l'allergologue et le dentiste. Une indication médicalement justifiée ainsi qu'une interprétation de test critique doivent être recherchées dans le futur.

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