Clinical-therapeutic relevance the environmental pollutants in the Pathogenesis of atopic diseases

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If the current statistics in the Federal Republic of Germany deal with almost 30 million allergy sufferers and if the same- if press releases report on new environmental scandals almost every week, then perhaps the question is justified whether between there is a connection between the terms "allergy explosion" and " environmental pollution". This development was until r2. Half of the practically unknown in the last century, but it has been noticed especially in the last 20-30 years in parallel with the increasing environment- a rapid spread of allergies, especially in the metropolitan areas.

Dthe total exposure to exogenous and endogenous noxes is shown primarily in animal experiments and in humans due to immunotoxic, sensitizing and neurotoxic Effect. In addition to known conditioning factors of all- allergic reactions (sensitizing potential of the allergen, intermittent exposure with different allergen concentrations- the presence of microbial bodies and potentiating Adjuvants), certain environmental pollutants will always have a a more important role is attributed to the induction of allergy. It is currently expected that over 100 million chemical compounds- with a daily increase rate of more than 25,000 new fabrics. More than 8,000 of them are in the daily Ge- custom [19]. They both cause air pollution by passenger cars- and irritant exhaust gases (SO_x, NO_x, CO_2) from industrial plants, heating and Combustion plants, due to excess ozone, industrial dust or Tobacco smoke as well as the soil and water pollution with pesti- pesticides, fertilizers, detergents, insecticides, heavy metals as well as chemical and radioactive residues of all kinds. The our own experience in the treatment of over 25,000 of all- patients show that in addition to allergic, pseu- allergic reactions caused by toxic-irritative environmental factors to come to the fore as the cause of the complex symptomatology.

In addition, through the daily intake of semi-finished The side effects of a whole range of additional substances- ports. These include many of the ones marked with ,,E" Preservatives, dyes, binders, gelling agents, emul- gators and flavor enhancers that give our food the long Durability, the appetizing appearance and the desired Taste ,give". Also active and auxiliary substances from the kos- metics and pharmaceuticals often carry, in addition to the dyes and synthetic fibers of the textile industry to intolerance reactions at [70]. Various polymorphisms of the 1st and 2nd detoxification phases, -enzymes (GSTNAT2, UDP, glucuronyl- transferase, sulfotransferase, etc.) play a significant role **[22,74].**

However, the function of various organ systems can also be the presence of chronic infections caused by Bak- bacteria, viruses and yeast fungi, which affect the skin as well as the mucous- skins of the respiratory and especially the gastrointestinal tract colonize, be additionally burdened. Your metabolism- and From- construction products (endo-, exo- and mycotoxins, indole, skatole, phenol, biogenic amines and others) together with the release- toxic heavy metal residues from pessaries, amalgam-

fillings, crowns and dental bridges or monomer materials from various implants (plastics, silicone, acrylates, the- talcement) a second group of endogenous stress factors, which also leading to a cumulatively toxic increase in the overall- contribute to the load. American authors have been using the The term "total environmental load" is used as a yardstick for the total- exposure to environmental stressors was introduced [1].

Effects of environmental pollutants on people

Contact with the foreign substances and chemicals mentioned here takes place primarily:

- in the respiratory tract via the breathing air
- in the gastrointestinal tract via food and drinking water
- about the skin

This contact causes very different effects. By The skin and mucous membranes attack most of the poisons that- processes and cell structures of the immune system and / or the The central nervous system. As a direct consequence, immuno- toxic or mitogenic effects on the blood cell subpopulations [67,72] as well as a loss of secretory immunoglobulin- buline [9,69], usually associated with an increased infecti- the maturity of the skin, mucous membranes and intestines, which Allergy sufferers are particularly pronounced[33]. The neurotoxic We- environmental pollutants are diverse and can be found in Form of headache, dizziness, difficulty concentrating- disorders, tremors, listlessness, sleep and heart rhythm disturbances- ranging from paralysis and depressive states manifest [13,27,58,59]. About the disturbed release of Ka- techolamines in environmentally sensitive hyperkinetics (dopamine) and We have reported to atopics (norepinephrine) [29,30]. Part of the Harmful substances are also found in adipose tissue, connective tissue, in bones and stored in the nervous system, and occasionally with negative The consequences for the affected person are mobilized again. Analytical Tissue studies can document this [18].

The allergists note that most of the diagnosed Allergy sufferers with asthma, neurodermatitis, allergic rhinitis or Urticaria at the same time environmentally sensitive patients with a history of- hypersensitivity to the slightest concentration- various environmental chemicals and biogenic poisons your symptoms are always allergic to a mixture of- and pseudoallergic reactions. You already speaks of allergotoxicology as a current interdisciplinary field, the allergy sufferer and assigned to environmentally sensitive patients be.

Provoking factors of allergic reactions

A complex mediated by their informational substances (cytokines- xes interaction of different blood and tissue cells such as Macrophages, lymphocytes, eosinophils, basophils, PMNs and Mast cells is involved in the induction of a normal immune response or an allergic reaction and the resulting irritation- dung components of crucial importance. After Coombs and Gell distinguish between immediate and delayed al- allergic reactions of type I to IV. The immune system is always involved in. In addition to a hereditary disposition to atopy manifestation- which is strongest when both parents are atopic (Prevalence of atopy of 60 - 80% in the branch generation), spie- various factors play an important role in the emergence of allergy. These include:

1. The sensitizing potential of the allergen

For example, it is known that early weaning and the administration of Formula foods containing strong allergens such as cow's milk, soy or foods based on egg and yeast components, to a Allergy induction in infants may result [68]. The chemical The composition of the so-called haptens is- dend for the sensitizing potency. The repeated intermittent- exposure to different allergen concentrations is also a well-known prerequisite for the induction of an allergy.

2. Microbial bodies

These can occur in the presence of various irritants such as phenols, Alum, metal salts,ThiomersaldieInduction of A single-reaction and Cause allergy in animal experiments [54,62]. With similar Ef- for example, it must be calculated for infants who are born at an early age due to optional or obligatorily pathogenic germs of the maternal Birth paths or the hospital were infected (Staph. au- reus, hemolytic E.coli, Proteus, Klebsiella, Pseudomonas, Candida albicans, etc), which leads to incorrect contamination of the Can lead to an abnormal flora in the intestine [38].

Similar microbial relationships with production of larger men- genes of sensitizing degradation products (e.g. alcohols, phenols) can also arise later due to intestinal flora decimating on- tibiotic treatments or under the influence of immunosup- radiation, cytostatic drugs with a pressive effect- or Cortisone therapies. The- type of microbiome-

disorders of the intestine are a feature of allergic diseases- it has become [6,31]. By fermentative fermentation, various intestinal yeasts and bacteria that have not been split Carbohydrates into organic alcohols [17] and short-chain fats- acids with a narcotic effect [14,17], which- marked postprandial fatigue and alcohol intolerance of the Patients and also lead to an increase in the intestinal- lead to permeability [31,36].

This is the explanation for the widespread intolerance reaction of the Atopic dermatitis patients against sugar and sugar products. It's han- this is a kind of pseudo-allergic reaction, causing due to a secondary disaccharidase deficiency, which results in diarrhea, Can manifest intestinal colic, migraine, skin redness and edema[31]. The non-digested and non-split sugars serve in the In the intestine, there is a strong multiplication of pathogenic bacteria, and before especially from mushrooms. Candida albicans and hemolytic E.coli are the main inhibitors of lactase activity [2,4].

The sprout fungi also form phospholipase A2, which makes Mem- branphospholipids are cleaved and converted via the arachidonic acid to Prostaglandins and leukotrienes with significant inflammatory- potential can be reduced: Toxic meat degradation pro- products (indole, skatole, phenols, biogenic amines), which are in the presence of a putrid putrefactive flora (Clostridia, Bacteroides sp., pathogenes Enterobacteriaceae), also contribute to the irritation of the The skin, the mucous membrane and the nervous system and act as adjuvant factors (phenols) are involved in the induction of IgE synthesis.

3. Environmental pollutants as adjuvant factors

Several mechanisms come into question here:

- Damage to the skin and mucous membrane barriers by chemical, physical or microbial influences on a direct violation of cell membranes and release of Inflammatory mediators such as histamine, prostaglandins and Leukotrienes, such as after exposure to pesticides [48,65,66], Alcohol and microbial poisons. The increased Permeability of the mucosal barriers leads to a increased allergen uptake and sensitization [36].
- Increased IgE production with the onset of allergic symp- tome was removed after exposure to irritant and diesel exhaust fumes [53], Cigarette smoke [5,10], Phthalates [39], and PCBs[24] on Documented people. Also heavy metals such as quecksilver [63], platinum [71], cadmium [42], lead [51] were produced in epidemiological studies have been described as allergy triggers. The pollutants can have their effect on various cellular levels unfold, depending on their absorption- and irritation potential. This could also include the repeatedly reported Sensitizations with IgE production after vaccinations with Explain aluminum hydroxide as an adjuvant [20,25,57].
- Induction of IgE synthesis after binding of pollutants serum proteins (e.g. formaldehyde and formaldehyde- derivatives [61] with the formation of new antigen structures.
- Conformational change of the cell surface after contact with Heavy metals with a sensitizing effect for antigen- specific T-lymphocytes with subsequent induction of the Proliferation and differentiation (contact allergies) [44.55].
- Intervention in the intermediate metabolism by influence- the structure and biological activity of various Enzyme systems, RNA, DNA and protein synthesis (Hgs+/SH proteins; DNase, ATPase, methyl Hg/oxidative Phosphorylation: alcohol, nicotine, MAO, DAO) [16,40,41,47,64].

As a rule, the symptoms of allergy sufferers and/or environmental- sensitive patients have a history of interactions with allergens, microbial factors and exogenous pollutant influences, resp. endogenous noxene [37]. This also explains the polymorbid clinical- the conditions that these patients have. importance preventive medical measures with the avoidance of relevant Allergens or environmental toxins and a corresponding healthy- this attitude is also evident in the psychosocial sphere.

Allergotoxic factors in neurodermatitis

Our own experience in the treatment of over 25,000 Neurodermatitis patients show that in addition to the allergic Me- mechanisms, more and more pseudo-allergic reactions caused by toxic irritant environmental factors (formaldehyde, exhaust gases, additive- food rich in substances, nicotine, wood preservatives, pesticides, Heavy- metals) as the cause of the complex symptomatology in the They are in the foreground [37]. About the intrauterine and postnatal The influence of such factors has also been reported [18].

The impairment of intermediate metabolism by the these environmental toxins cause an ever weaker pro- reduction of high-energy substances (ATP) in allergy sufferers. This is also one of the main causes of the low values of cyclic Nucleotides (cAMP) with a regulatory function upon release of Mediators. The cAMP values are further reduced due to the simultaneous blockade of beta-adrenoceptors[29,52] and the increased activity of the degrading enzyme phosphodies- terase [12].

Heavy metal exposure in atopic dermatitis

About the immuno- and allergotoxic relevance of severe- total loads (cadmium, lead, platinum, copper) have been- more and more frequently reported [15,26,43,45,72]. Where

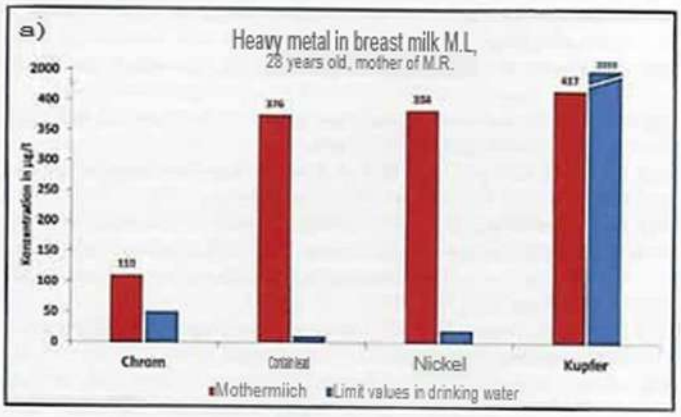
Mercury is given a special role, especially by the fierce discussion on the topic ‚amalgam". It is important here from In the beginning, between the allergic potential of mercury (up to 17% allergy incidence with a positive epicutaneous test) and its chronic toxic potential, which is especially important for allergy sufferers to an accelerated summation effect with other noxes forren can distinguish. There are several attack machanisms, e.g.:

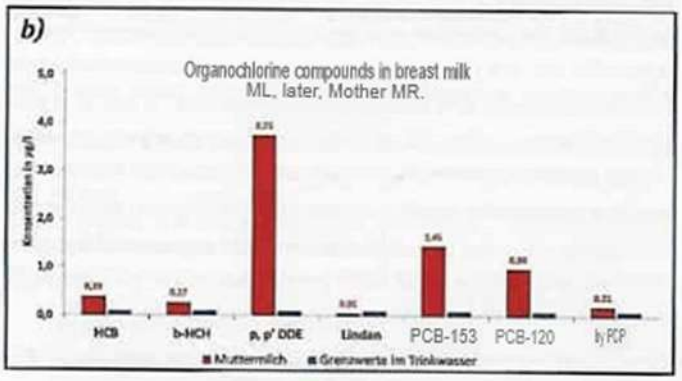
- Binding to serum and cell proteins (albumin, coenzyme A, SH Proteins) with interaction in the intermediate metabolism [16]
- Increase in the cellular mitosis rate in lymphocyte populations [11]
- Induction of IgE synthesis with an increase in allergen-specific IgE response in rats [54,63]
- Waste of T-lymphocytes, T-helper cells and NK cells after mercury mobilization from amalgam fillings [3.46]
- Promoting inflammatory reactions by activating enttalking enzyme systems (e.g. collagenases [7)
- Of particular importance for patients is the transformation derionized Hg---form by methylation into a multiple more toxic, fat-soluble organic compound (methylmercury-silver) [16]. Oral and intestinal bacteria also play here (Streptococci, clostridia) [73]and especially yeast fungi (Candida albicans) [16] a crucial role and let the differences in symptoms from an amalgam carrier to partially explain to others.

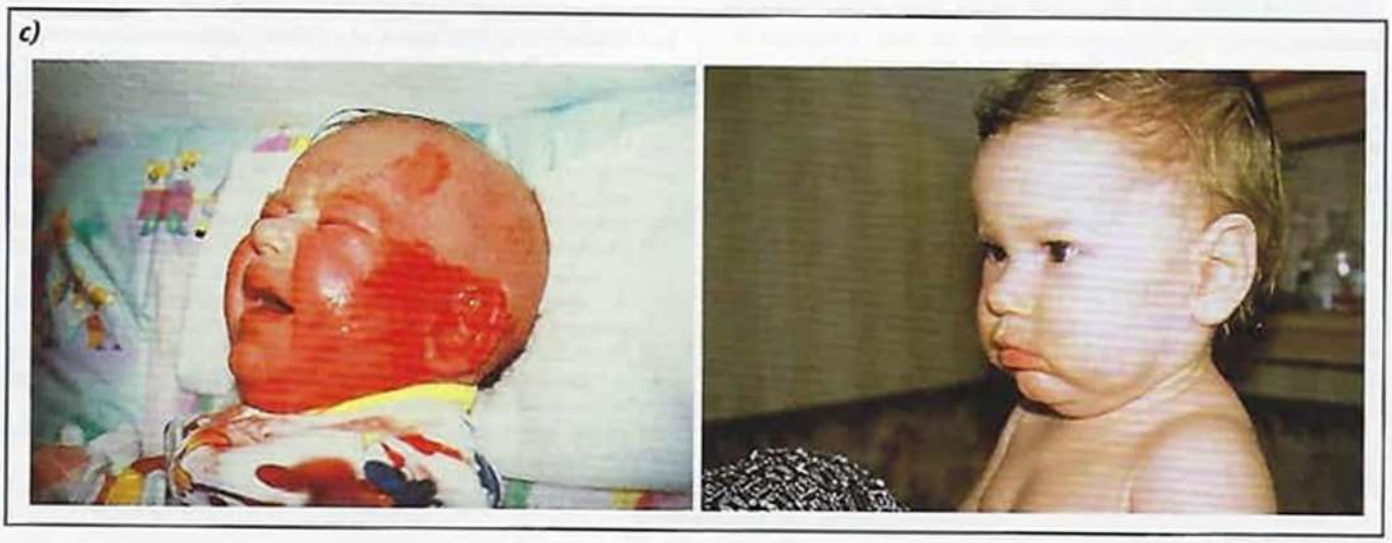
Even if the clinical relevance of these results for the patho- the genesis of neurodermatitis is still being discussed, the main- in principle, the most important sources of mercury are always the same: as Additives of various medicines (in ointments, drops, Impfruits, etc.), fish-rich food, offal (from 0.3 to 2.3 ug / day) and especially the amalgam fillings (3 to 17 ug Mercury attenuation/day[16]). The mercury has a-marked affinity for organs such as the epithelium of the gastrointestinal-skin, for hair, thyroid, liver, pancreas, For the kidneys and for the brain, especially in the gray matter, as well as in core areas of the brain stem and in the cerebral cortex **[21,23,56].**

Magnetic resonance tomographic examinations of the head are not more evaluable when patients use heavy metal alloys in the mouth [49]. Own examinations for atopic dermatitis-kern and psoriatics show with the help of the so-called chewing gum-a significant release of mercury, which is associated with the number of of the fillings are directly correlated[34]. This phenomenon is not only for patients, but also for pregnant women and mothers of-interpretation, because according to recent findings, the mercury leads to- release both to a transplacental strain of the fetuses [18,50] as well as the infants through breast milk [8,60]. egg-confirm gene determinations of harmful substances in breast milk the exposure to heavy metals and organotoxins and the-to a large extent, the severe symptomatology of neurodermatitis

Fig. 1: Clinical picture of a neurodermatitis child (6 months), fed exclusively with contaminated breast milk: (a) Increased values of Heavy metals; (b) organic pollutants in the breast milk sample; (c) Clinical picture of the infant before and after 5 weeks of integrative therapy in the Spezialklinik Neukirchen.







Säuglinge (Abb. 1 ein, b, c). Die Mobilisierung aus den Füllungen ist besonders groß bei Verbrauch von heißen Getränken (Kaffee, Tee), Fruchtsäften, frischem Obst oder beim Kaufen von Kaugummi. Sterben allergotoxische Wirkung des Quecksilbers wird häufig durch die synergistische Wirkung anderer Umweltschadstoffe (Pestizide, Dioxin, Furan und andere) verstärkt. Schonim Jahr2006 sprach sich das EU-Parlament ganz gegen den weiteren Ge- Amalgam in der Zahnmedizin aus und empfohlen eine starke Einschränkung bei der Verwendung von Quecksilber sowohl in der Zahnmedizin als auch in anderen Bereichen.

Zwei Tatsachen stehen nach unserer Erfahrung mit über 25.000 Allerglkerfest:

a) Bohrarbeiten in den Amalgamfüllungen bei Allergikern ohne entsprechende Schutzmaßnahmen (Kofferdam, Antioxidantien) führen in der Regel zu einer schnellen Verschlechterung der Symp- Wälzer.

b) Therapieresistente, rezidivierende Problemstellen im Bereich der Kopf-, Hals- und Gesichtshaut sowie chronischer Heuschnupfen und Rachensymptome bleiben nach Entfernung der Amalgamfüllungen gefolgt von entsprechenden Ausleitungsmaßnahmen dauerhaft aus [35].

Prophylaxe und Therapie

Wichtige Präventivmaßnahmen bei Allergikern finden ihren Platz schon bei Schwangeren, bei denen die Vermeidung starker Allergene in der Nahrung [75], Alkohol, Nikotin und anderen exogenen Schadstoffe, sowie die Antibiotikabehandlung des Neugeborenennes [20] zu einer Senkung des Atopierisikos des Kindes führen kann. Auch die Sanierung endogener Belastungsfaktoren wie Infekte aller Kunst, der Haut, der Schleimhäute, der Geburtswege und des Darmes findet ihre berechtigte Anwendung. In der Therapie der Neurodermitis hat sich gezeigt, dass eine allergenarme Diät, die im Rotationssystem angebotenen werden, zusammen mit der Sa- niere mikrobieller Herde, schadstoffausleitenden [28], immunmodulierenden und psychologischen Betreuungsmaßnahmen einen wichtigen Beitrag zu einer langfristigen und mitunter auch dauerhafte Beschwerdefreiheit leisten kann [32,37,38].

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