Occupational and Environmental Risk Factors for Allergic and Hypersensitivity Reactions

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1 Introduction

Nowadays, allergic disease is accepted as a significant public health problem which is frequently observed worldwide. In recent times, the mechanism of allergic disease has focused on the genetic and environment interaction. So, it is important to consider the occupational and environmental risk factors of allergic disease. Allergy is no longer considered to be solely related with heritage, but the negative effects of modern life due to technological developments are accepted as important factors in the etiology. An allergy is a hypersensitivity reaction of a person to the environment, described as the surroundings to which it is exposed. Allergic reactions are not of one type, they can be created in various ways, can develop in various body regions and differ in severity. These allergic substances can be exposed to the airway, skin contact or taken orally with foods.

Environmental allergic risk factors can affect people at any age from childhood. Health complaints related to allergy are commonly seen in the general population. It has been reported that allergic conditions are present in 10% of the community in the USA, in 15-30% in European countries, and in 9-20% in Turkey according to different studies (Pawankar et al., 2011; Greiner 2011; Kurt et al., 2009). However, these rates have increased over time, especially in industrialized countries. Allergy affects the quality of life of people in a markedly negative way by disrupting their health. For example, in recent decades, allergic eye problems have frequently been a major health problem for workers. One of the main symptoms of allergy is ocular symptoms: irritation, foreign body sensation and dryness. The work climate has changed a lot and employees are very dependent on their eyes in the office during the working day. Many workers have allergic eye symptoms in chemical metal factories and paint shops. There are some people who only have work related allergy symptoms in their eyes (e.g., latex powder from gloves, tree dust in joineries etc.). Also, air conditioning plays a more important role in many work places than previously thought. Air conditioning is one of the main sources for many kinds of allergic or allergy-like eye problems, allergic conjunctivitis and dry eye. Problems with the internal air of buildings directly affect eyes that are the most sensitive part of the body. At the same time, allergy is notably one of the main reasons for school and work absenteeism.

Allergic reactions are not of a single type, they occur by many ways, may involve different parts of the body, and may be of varying severity. Although the term allergy suggests symptoms including pruritus in the skin, nasal discharge and sneezing, many different allergic conditions occur depending on the organ involved and the agent affecting the individual. These conditions mainly include allergic rhinitis, allergic bronchial asthma, allergic coryza and conjunctivitis, cutaneous allergy, food allergy, drug allergy, insect allergy, and occupational allergies arising from substances found in the workplace. Allergic rhinitis is a high prevalence morbidity affecting 10-20% of the general population in many developed countries (Asher et al., 2006). Allergic rhinitis is divided into three subgroups; continuous, seasonal and occupational, depending on the time or place of exposure to allergens. Perennial allergic rhinitis occurs most commonly with house dust mites and animal dander. Seasonal allergic rhinitis occurs due to hay fields or different tree pollens. The morbidity of seasonal allergic rhinitis depends on the geographical region, the pollen season of plants, and local climatic conditions.

Allergic diseases occur commonly in childhood (Jackson et al., 2013). Approximately one out of every four children in the world has an allergic disease (asthma, allergic rhinitis, allergic eczema, food allergy, drug allergy, insect allergy, or urticaria). The allergic influences of environmental conditions in humans start before birth, during pregnancy of the mother. Most commonly, exposure during childhood has a negative influence on the developmental prognosis and life too. The factors involved in the occur-
rence of an allergy in children’s future include the mother’s nutrition, whether the mother smokes, and the level of pollution in the environment during the intrauterine period. Many studies have proven that environmental factors including smoking and passive smoking during pregnancy increase the risk of both asthma and allergy in children (Dotterud et al., 2013). In addition, the presence of intensive humidity in the household may later trigger the development of asthma. Also, among the important factors that determine whether a child will be allergic or not are nutrition after birth, the presence of breastfeeding and even the mode of delivery (normal vaginal or cesarean). Children, especially those with asthma, get tired more quickly, sweat and cough more compared with their peers from the early periods of life. Some causal triggers for this disease include surroundings that contain allergens or air pollution, influenza, work environment, chemical residues on clothing, intense odors, and excessive exercise (Friis et al., 2013).

Currently, allergies are not addressed only in relation with the genetic predisposition, but the role of the negative impact of modern life conditions is being discussed more intensely. Many factors which cause allergy are not harmful at a level that threatens life, and they do not necessarily lead to discomfort or have an impact in one hundred percent of people. Studies show that genetics and environmental factors are involved together in the occurrence of the disease (Carlsten & Melen 2012; Kauffmann et al., 2012; Mutius, 2004). A gene-environment interaction occurs in this disease at a high rate. Thus, allergic diseases can be defined as an eco-genetic phenomenon with in this regard. Allergic diseases are characterized with an abnormal immune response to environmental antigens which are confronted frequently. Substances which trigger allergic reactions and lead to allergic reactions are called allergic substances or allergens. These substances can be taken in by the respiratory tract, by skin contact or by the oral route with foods. Allergy symptoms may be transient for some people and continuous for others. These range from transient discomfort to severe and life-threatening conditions, including severe asthma. Symptoms change from person to person. Inadequate diagnosis and treatment can lead to more frequent attacks.

This section of the book discusses environmental and occupational risk factors which are thought to a great extent to be responsible for allergic diseases, with an emphasis on the role of indoor and outdoor air pollution, preservatives in our foods and unfavorable workplace conditions. Based on the epidemiological data in developed and developing countries, we aim to draw attention to the current status and new ways of understanding allergies and propose solutions for the future.

2 Prevalence

In recent years, there has been an increase in the prevalence of allergic diseases, especially in developed countries (Wong et al., 2013; Hong S., 2012). Allergic diseases are observed more commonly in industrialized countries compared with agricultural countries, and in urban populations compared with rural populations (Ghosh et al., 2013). Environmental pollution, climate change, preservatives in foods, new generation drugs, and rapid industrial developments have all been shown to cause this increase (Barnes et al., 2013; Thong & Tan, 2011). The unfavorable factors which are continuously present in an individual’s life including pollutants in drinking water, foods, and indoor and outdoor air, inhibit or weaken the immune system and render an individual more sensitive to allergenic substances. The World Allergy Organization reported that 22% of the participants in global scale studies (approximately 250 million people) suffered from at least one of the allergic diseases. These studies were conducted with approximately 1.39 billion individuals in 33 countries (Warner et al., 2006). In Turkey, allergic asthma has been found with a rate of
2- to 5%, allergic rhinitis and allergic eczema have been found with a rate of 0.08% and food allergies have been found with a rate of 5% (Dinmezel, 2005; Emri, 2005). Asthma has also shown a significant increase in Turkey (TUİK, 2013; T.C. 2009; Ones, 2006). In addition, according to recent evidence, it has been emphasized that only 1/3 of asthma cases use to occur as a result of allergic causes 30 years ago, but this rate has currently reached 80% (Kauppi et al., 2013; Wertz, 2010). The World Health Organization reports that there are about 300 million asthma patients worldwide. Each year, 180,000 individuals lose their lives because of this disease worldwide. In the USA, it has been reported that the number of asthma patients has shown a significant increase of 60% since 1980 (Akinbami et al., 2012; Moorman et al., 2012).

3 Occupational and Environmental Risk Factors

Risk factors for an allergy can be evaluated in two categories including host factors and environmental factors. As with many diseases, allergic diseases also occur when adequate environmental factors are present on an appropriate genetic background (Wang, 2005; Okatraia et al., 2013; Pleil et al., 2012; Shah, 2012). Many individual factors including heredity, sex, race and age may regulate an allergy. There are many different allergens. Among these, the most common ones and the ones which lead to allergic disease include environmental allergens (D’amato et al., 2010; Kurt, 2010). Environmental factors include foods, clothes, air, water, detergents, cleaning materials, chemicals in the workplace (Kim et al., 2013; Moual et al, 2008; Peden, 2010). These are divided as indoor and outdoor factors by their localization. The reason that this differentiation is made is that the type and findings of allergic disease varies according to the type of allergen. For example, the most common indoor allergen is house mites which are found in house dust. Mites lead to allergies throughout the whole year, in all four seasons. In contrast, outdoor allergens include mainly hay fields, tree and flower pollens which mostly lead to allergies in the spring. Individuals may also be exposed to other allergens including foods, drugs and insects, which do not precisely fit in this classification due to differing time periods and settings. Allergic contact urticaria and contact dermatitis/eczema, occupational asthma and rhinitis are one of the most common occupational allergic skin and respiratory diseases. Occupational allergies are new emerging diseases that seen among workers who exposed to allergic substances in the workplace environment. Occupational allergic diseases are common with a prevalence of % 5 -15 in the worldwide. As can be seen in Table 1, 2, 3, 4 chemicals, physical agents etc., a lot of substances used at work can cause the allergy (Vandenplas et al., 2011; Peden & Reed 2010; Wick, 2013).

The occurrence of allergic diseases has increased in parallel with the changes in modern life style in urban regions. It was thought that industrial sources and environmental pollution were responsible for this. In diseases which occur as a result of unfavorable environmental factors, therapy can be provided not only by way of drugs, but also by way of investigations to find the environmental causes of the disease, eradication of these causes and increasing the resistance of the patient (Yeşillik & Öztürk, 2013). The most important point in the protection from allergies is the determination and eradication of suspicious environmental allergens in closed settings such as houses and workplaces where the individual lives, or reducing contact with these allergens to a minimum.
Occupation | Allergens
---|---
**Contact dermatitis:**
Bakers | Flavoring, oil, antioxidant
Building trade workers | Cement (Cr, Co), rubber, resin, wood
Caterers, cooks | Vegetable/fruit, cutlery (Ni), rubber gloves, spice
Cleaners | Rubber gloves, nickel, fragrance
Dental personnel | Rubber, acrylate, fragrance, mercury
Electronics assemblers | Cr, Co, Ni, acrylate, epoxy resin
Hairdressers | Dye, rubber, fragrance, Ni, thioglycolate
Metal workers | Preservative, Ni, Cr, Co, antioxidant
Office workers | Rubber, Ni, dye, glue, copying paper
Textile workers | Formaldehyde resin, dye, Ni
Veterinarians, farmers | Rubber, antibiotics, plants, preservatives
**Contact urticaria:**
Cooks | Animal products, wheat, vegetables
Health-care providers | Latex
Hairdressers | Dyes, latex
Animal workers | Animal dander

**Table 1:** Allergens and occupations causing contact dermatitis and urticaria

<table>
<thead>
<tr>
<th>Agent</th>
<th>Occupation/industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals, flour</td>
<td>Flour mills, bakers, pastry makers, the Mediterranean flour moth</td>
</tr>
<tr>
<td>Latex</td>
<td>Health-care workers, laboratory technicians</td>
</tr>
<tr>
<td>Enzymes</td>
<td>Baking products production, bakers, detergent production, pharmaceutical industry, food industry</td>
</tr>
<tr>
<td>Animals</td>
<td>Laboratory workers, farmers, sea foods processing</td>
</tr>
<tr>
<td>Isocyanates</td>
<td>Polyurethane production, plastic industry, moulding, spray painters</td>
</tr>
<tr>
<td>Metals</td>
<td>Metal refinery, metal alloy production, electroplating, welding</td>
</tr>
<tr>
<td>Biocides</td>
<td>Health-care workers, cleaners</td>
</tr>
<tr>
<td>Reactive dyes</td>
<td>Textile workers, food industry workers</td>
</tr>
<tr>
<td>Woods</td>
<td>Sawmill workers, carpenters, cabinet and furniture</td>
</tr>
</tbody>
</table>

**Table 2:** Principal Agents Causing Occupational Asthma, Rhinitis and Conjunctivitis

<table>
<thead>
<tr>
<th>High molecular weight</th>
<th>Low molecular weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain dust (including mites)</td>
<td>Diisocyanates (many sources)</td>
</tr>
<tr>
<td>Bakery dust</td>
<td>Acid anhydrides</td>
</tr>
<tr>
<td>Fish proteins</td>
<td>Western red cedar (plicatic acid)</td>
</tr>
<tr>
<td>Laboratory animals</td>
<td>Colophony</td>
</tr>
<tr>
<td>Bird proteins</td>
<td>Penicillin</td>
</tr>
<tr>
<td>Natural rubber latex</td>
<td>Nickel</td>
</tr>
<tr>
<td>Enzymes, especially detergents</td>
<td>Platinum</td>
</tr>
<tr>
<td>Mold proteins</td>
<td>Vanadium</td>
</tr>
<tr>
<td>Vegetable gums</td>
<td></td>
</tr>
<tr>
<td>Soy bean dust</td>
<td></td>
</tr>
<tr>
<td>Cotton, coffee, and other seed dusts</td>
<td></td>
</tr>
<tr>
<td>Psyllium</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3:** Some common occupational allergens due to molecular weight
<table>
<thead>
<tr>
<th>Occupation</th>
<th>Potential Allergen and Manifestation</th>
</tr>
</thead>
</table>
| Bakery and Food Service Workers          | Wheat flour exposure can cause respiratory (e.g., rhinitis, nasal allergies, etc.) and eye symptoms or a systemic reaction  
Soy beans, fish, shellfish, and egg can cause systemic reaction  
Peanut-based products can cause systemic allergic reaction |
| Carpenters and Wood Workers              | Exotic hardwoods can cause rhinitis, asthma, or contact dermatitis                                                                 |
| Chemical and Pharmaceutical Factory Workers | Enzymes, medication, and biological dusts can cause sensitivity allergy  
Ammonia, bleach, and chloramines can cause rhinitis |
| Cleaning Staff                           | Bleaches and enzymes from detergents can cause contact dermatitis or asthma                                                                 |
| Electrical Workers                       | Fumes from soldering may cause lung disease                                                                 |
| Engine Mechanics                         | Benzene can cause contact dermatitis                                                                 |
| Farm Workers, Dockworkers, and Cotton Workers | Moldy hay stored in silos can cause hypersensitivity pneumonia (now rare)  
Poultry and plant dusts can cause asthma |
| Florists                                 | Primula, ivy, and lilies can cause contact dermatitis                                                                 |
| Hairdressers                             | Paraphenylene diamine in dyes and bleaches can cause contact dermatitis and eczema  
Persulfates in permanent wave solution can cause respiratory distress or dermatitis or eczema |
| Laboratory Workers                       | Animal dander, saliva components, or bird proteins can cause asthma  
Endotoxins can cause asthma  
Solvent vapors and inorganic acid vapors or mist may cause rhinitis |
| Laborers                                 | Chromium in cement can cause contact dermatitis                                                                 |
| Medical Workers                          | Latex rubber in gloves, tubing, and medical supplies can cause contact dermatitis                                                                 |
| Miners                                   | Coal dust can cause nasal symptoms or chronic lung disease  
Silica can cause pulmonary complications                                                                 |
| Pharmacists                              | Psyllium dust may cause rhinitis  
Antibiotic exposure may cause sensitization allergy or contact dermatitis |
| Printers                                 | Acrylic dyes can cause contact dermatitis and rash                                                                 |

Table 4: Common Workplace Allergens

### 3.1 Internal and External Air Pollution

Air pollution is a significant global public health problem which seriously threatens the health of communities in both developing and developed countries (Takizawa et al., 2011; Lee, 2013). Smoke released from vehicles in traffic, especially diesel exhaust, and the particles it contains may cause irreversible damage when they enter the respiratory tract. Studies have shown that allergic diseases and asthma are observed with a higher rate in children who live near intensive traffic compared with children who live far from intensive traffic (Gül et al., 2011). Because children breathe in and out at a much higher rate and spend more time in the outdoor air during play and sporting activities, their rate of impact due to air pollution is higher. Diesel exhaust smoke contains ultra small particles that create air pollution, and these have a carrier role for allergenic substances. These particles present the allergenic substances, which adhere to their surfaces, to the immune system and increase the likelihood for the development of an allergy. Ozone is a side-product of diesel exhaust smoke and is an oxidant substance which causes serious...
damage both to the atmosphere and the respiratory tract of humans. Ozone causes a burn-like inflammation on the surface of the respiratory tract by damaging the inner-layer membrane and this leads to sensitivity. Over time, as the respiratory tract becomes more sensitive, asthma occurs. Symptoms of bronchial narrowing; coughing, wheezing and dyspnea are observed as a result of any external stimulus (smoking, infection, clothing, chemical odors etc). The antioxidants produced by our body can normally overcome low rates of external air pollution. However, when air pollution is increased to a high degree natural antioxidant mechanisms are insufficient, because the burden on the oxidant substance is increased too much and an inflammatory response occurs in the body. This unfavorable response in the body mostly results in recurrent respiratory infections and bronchial asthma. The most efficient way to reverse this picture caused by air pollution is to increase the level of antioxidant substances in the body.

Many asthma patients feel discomfort in cold weather because their respiratory tract has hypersensitivity to the cold. This arises from a cold air allergy. As a result of inhalation of cold air, drying in the throat and narrowing in the trachea occur. In addition, nasal breathing becomes difficult in extremely cold weather. During nasal breathing, there is a sensation of burning and pain. When asthma patients breathe through the mouth, their respiratory tracts become narrowed. The reason for this is that the air entering the mouth has not warmed sufficiently. Nasal breathing has a more relieving effect on the respiratory tract compared with oral breathing, because it enables the air entering the respiratory tract to be warmed and controlled.

The rate of air pollution in closed settings is 2-5 fold higher compared to open settings. In studies performed on this issue, it has been reported that disruption of the internal air quality may lead to various respiratory diseases (asthma etc.), allergic diseases (hypersensitivity pneumonitis etc.) and cancer (Oeder et al., 2012; Gül et al., 2007). Anthropogenic elements including lead, mercury, cadmium, and chrome, among other heavy metals, contaminate the internal air by way of entering/leaking of particles and soil dust from external settings to internal settings. Continuous exposure to low concentrations of volatile organic compounds (VOCs) leads to respiratory tract diseases and asthma. Benzene, toluene, ethyl benzene, xylene and styrene have high toxicities and can be classified as the most harmful VOCs. As the exposure concentration increases, the effects become more severe and coma and mortality may be observed. Strong irritating chemicals are formed as a result of the reaction of internal VOCs with ozone. It has been reported that internal bio-aerosol levels were high in humid and warm regions. Also, VOCs and ozone could reach considerably high levels in areas where smoking, copy devices, printers and computers were present, and indoor use of cleaning materials increased the amount of VOCs at a high rate.

Special attention should be paid to important places like schools and day-care centers because they are closed settings and contain intensive levels of allergens. Classes in schools constitute a high risk in terms of air pollution. Although smoking is generally not permitted and activities including cooking are not performed in schools, high particulate matter (PM) concentrations are observed here. However, it has been proposed that PMs originating from internal settings have a lower toxic effect compared with external PMs because of the chemical composition contained. As a result of the studies performed, it was found that internal air pollution concentrations were at higher levels in crowded settings where there was intensive all-day activity of human groups sensitive to air pollution, including day-care centers and primary schools, especially during winter. Children, whose immune systems are weaker compared with adults, are confronted with allergic diseases in their schools. Tens of students who are in the same area rapidly consume the clean air in the closed setting and share potential risks of asthma and allergies. Chalk dust, newly-painted classes and dust in the classrooms cause allergic diseases. Day-care centers contain more materials that cause allergies in addition to these factors. Day-care centers provide appropriate liv-
ing areas including carpets, beds, pillows, curtains and hairy toys, all of which have been found to increase the risk of the occurrence of allergic diseases. Preventive measures should absolutely be taken and risk factors should be controlled.

3.2 Mold and Dust Exposure

Mold can be present in both internal and external settings (Gelincik et al., 2005; Jenerowicz, 2012; Repo nen, 2013). While mold in external settings can trigger allergies in the spring, summer and autumn, mold in internal settings may cause problems for the whole year. In most cases the harmful effects are due to their toxic effects. In these cases these places should be closet until the reparations are done. It is not always possible but the prolonged exposure makes the symptoms worse.

Any house may produce mold under the appropriate conditions. They may be present even if they cannot be observed visually. Like dust mites, mold also likes humid environments. Mold invades by producing particles which can extend into the air. These particles may transform into house dust. In houses where house dust arising from mold is present, allergy symptoms may be observed if this air is inhaled by a person who has a sensitivity to mold. Formation of mold in internal settings depends on two factors: the first one includes free humidity which occurs as a result of a relative humidity above 50%, and leaks from pipes or plumbing and water sources. The second one is anything on which they can grow. Mold usually grows on wall boards, textile products or wood, but they can grow almost anywhere when they find an appropriate environment.

Dust mites mostly collect in materials including carpets, cushions, pillows and blankets. Dust mite allergy may lead to many symptoms and conditions. These include asthma, difficulty in breathing, coughing, wheezing, a sense of obstruction in the chest, allergic rhinitis, obstructed and draining nose, pruritic and draining eyes, low concentration, headache and sleep disturbances and eczema, pruritus, rash and vesicles in the skin. Dust mite allergy may give continuous discomfort. It has many unfavorable effects on the state of health and quality of life. Children spend a lot of time in their homes. The possibility of asthma in children who grow up in environments that have dust mites is considerably high. The most important treatment method in house dust allergy is keeping away from allergens. Anti-allergen bed sheets, bed clothing and air-cleaning devices are very helpful in keeping away from allergens and creating a treatment opportunity. Further as preventive measures should be emphasized the good cleaning: in all work places, schools, day- care centers and homes. The role of air conditioning is important because in many instances the regular service is neglected, the incoming air in unclean due to unclean tubes and filters.

3.3 Foods

Food allergies and hypersensitivity certain food substances interest many people (Gelincik et al., 2008; Hsu, 2013; Sicherer, 2010). In food allergies, the defense system of the body perceives the proteins found in food substances as dangerous foreign substances and become active. Even the smallest amount of the intolerable food substance may lead to an allergic reaction. Reactions usually occur in a short time following consumption of the food substance and food allergic reactions may be lethal in some cases. In case of an allergy, symptoms usually occur within a few hours following eating. Because the reaction occurs against a protein, purified starch or fat fraction of the food substance in question is tolerated well. The most common symptoms include cutaneous reactions and gastrointestinal symptoms. Anaphylactic shock is an acute allergic reaction which leads to signs in multiple organs. Reactions may be in the form
of swelling in the mouth/throat/mucosa, dyspnea, a sense of suffocating, vomiting or loss of consciousness. Allergic shock is severe and severe reactions are frequently observed.

Fruit and vegetable allergies usually arise from cross-allergies. Cross-allergies against fruit and vegetables lead to symptoms in the mouth and throat. Cross-allergy means that the body perceives no difference between the substances against which the body has an allergy and the proteins in other foods, since their proteins are similar. Generally, this condition is manifested with pruritus and swelling in the mouth, nose, lips and throat (oral allergy syndrome). Symptoms also occur in the abdomen/intestines and skin.

Fish allergies may be a severe form of food allergy. Some individuals with a fish allergy have reactions to any kind of fish. Some may show reactions to codfish, but may tolerate salmon, trout or mackerel. Some individuals with fish allergies may give reaction to the steam during fish boiling. Shrimp, crab, crayfish, lobster and other shellfish may lead to allergic and non-allergic reactions. Generally, small amounts taken by foods or steam are sufficient for severe reactions. Since the main allergen found in shellfish sea products is also found in mollusks including snails, calamari and mussels, cross-reactions between different species is common. Mite and cockroach allergies may lead to cross-allergies with shellfish sea products and mollusks, but this usually has no clinical significance.

Pea, soybean, lupine flour and peanuts belong to the same vegetable family. Therefore, cross-reactions may occur between these species. For example, lupine flour may lead to allergic reactions in some individuals with a peanut allergy. Lupine flour is added to some full- and half-cooked cake-pie products. Although peanuts are among the food substances which trigger severe allergic reactions most commonly, not all individuals with a peanut allergy have severe reactions. Although most individuals with a peanut allergy tolerate other tree nuts, it should be noted that these are generally observed together in foods. The person may give a reaction to one or more hazelnut species. Seeds which lead to allergic reactions include sesame seed, sunflower seed and poppy seed. Nut and seed allergies may lead to severe reactions.

In wheat allergies, one or more proteins in wheat, rye and barley may trigger allergic symptoms. Positive allergy tests are generally observed for wheat without a food allergy with wheat intake. Therefore, it is especially important to confirm if only a positive test result is present or not for a clinical allergy or for example hay field pollen allergy. Wheat allergy occurs when people inhale flour, but these people may tolerate foods in which wheat is used. Celiac disease is a chronic inflammatory disease in which wheat gluten, barley and rye-like proteins cause an immune reaction in the intestines. The intestines are normalized with a strict gluten-free diet which should continue for a life time. Celiac disease is generally named as gluten intolerance. In children, feeding with cow’s milk may cause a risk of allergy. The most common findings include eczema, urticaria, diarrhea and vomiting. The tests are not positive in all children with a milk allergy. Therefore, when a diagnosis should be made elimination of foods should be performed and the diagnostic test should be repeated. Egg allergy is the second most common allergy in children and as with milk allergy, most children grows out of the allergy as they get older. The tolerance limit varies from person to person, but some individuals are so sensitive that they can show reaction to egg protein residues found in cleaned containers. Both egg white and yolk may lead to an allergic reaction. It is important that in day-care centers and schools the children should have a special diet without being real allergic to the food which should be avoided.

3.4 Latex
Currently, the use of latex is becoming more and more common. It is included in many products we use in our homes and workplaces. High-risk groups include healthcare workers (medicine, dentistry etc.) and workers who work in the manufacturing of latex. Allergies to natural rubber latex (NRL) and occupation-related dermal problems (disinfectants, rubber, metals and detergents) associated with dental products are seen very common among dentists. Latex gloves manufacture workers suffer from occupational asthma that is caused by latex allergy. Latex allergy is present in approximately 1% of the world’s population. In addition, latex allergy is observed in 17- to 25% of healthcare workers (Madan 2013; Marcoux, 2013; Pontén, 2013).

Latex allergy is the hypersensitivity to the substance which contains the natural latex core (not synthetic) found in rubber trees (Öztürk et al., 2008). If this hypersensitivity reaches advanced dimensions, the individual’s life may be jeopardized. It is very dangerous and disadvantageous to come into contact with products containing latex for individuals with latex allergy. As the degree of contact with such type of products increases, the risk also increases. Individuals with latex allergic may experience cross-reactions to tropical fruits - the so called "Latex-fruit syndrome". The history of the patient should be taken and a latex allergy should be considered even in individuals in whom physical examination reveals the mildest findings. Hypotension, tachycardia, urticaria, flushing in the face, sudden dyspnea, pruritus, abdominal pain, syncope and swelling in the lips are the findings that should be noted. If the patient experiences some kind of respiratory difficulty, though to a mild degree, when he/she puts on gloves or inflates a balloon, a latex allergy should be suspected. Skin tests or blood tests can be performed before the diagnosis of a latex allergy.

As with all allergic diseases, the best treatment method for latex allergy is keeping away from the allergic substances which mean prevention, because as the degree of contact of the person who suffers from latex allergy with this substance increases, his/her complaints will increase accordingly. In a person in whom latex allergy is suspected, antihistamines and drugs containing cortisone should be used before treatment. When a latex allergy develops, there is no known special treatment method. The known therapies for allergic reaction are performed in association with supportive treatment.

3.5 Nickel

Nickel is a basic element which is used in different plates and alloys. The pure form of Nickel is as bright as silver. Nickel is one of the most common metals found in our surroundings. Nickel allergy is a reaction of the body as a result of contact with nickel in a person who has hypersensitivity to this substance (Braga, 2013; Garg 2013; Lidén 2013). Nickel allergy may cause eczema in advanced stages in manufacturing workers. This arises from contact with many substances containing nickel including door handles, taps (excluding stainless steel) and coins. It is mostly contained in imitation jewelry, metal covered pots or pans used in kitchens, shiny door handles, zippers, hairclips, pins, knitting needles, scissors, glasses frames, buttons and coins. In addition, nickel may be found in bleaches, hair dyes and some food substances. There are some foods which contain high amounts of nickel (for example, chocolate, peas, lentils, walnuts, sunflower seeds). When people with a nickel allergy consume such foods, their states may deteriorate and their eczema may get worse. If a person with a nickel allergy comes into contact with this substance, allergic eczema may be observed in any part of his/her body. Eczema, whether newly formed or recurrent, causes vesicles and inflamed wounds on the skin in association with redness and swelling in the skin. When the person comes into contact with the substance against which he/she has an allergy. In chronic contact eczema, severe pruritus is observed in association with drying and cracks on the skin.
It is known that nickel allergy is observed more commonly in women compared to men. The most important reason of this is the valuable materials which women carry on their bodies. Especially jewelry placed on the ears, umbilicus and nose after piercings, are among the main factors which trigger nickel allergy. In this way, the contact of nickel with the skin, and even blood, causes the initiation of some hypersensitivity. After an individual becomes allergic to nickel, it is not possible for them to get rid of it completely. However, he/she may alleviate the effects of this allergy by taking precautions and receiving treatment.

4 Conclusion

Allergy is a very common cause of disease in the general population. Multiple factors can trigger this disease. Occupation and environment are also factors for allergic diseases. Occupational and environmental allergic diseases are one of most important public health problems which interest all countries to a great extent. It is known that approximately 15-25% of the world’s population is fighting with this disease. Nowadays when adulthood and childhood diseases are investigated, it is clear that the prevalence of allergic diseases has increased. It has been proposed that these changes are related with the increase in occupational and environmental allergens due to industrialization in recent years.

Occupational and environmental allergic diseases are preventable by appropriate preventative strategies. The most efficient approach for prevention and protection is defining and avoiding the allergen. To this end, the most important step in the diagnosis is a detailed history including the genetic predisposition and exposure of occupational and environmental agents. With some basic environmental measures and even simple hygienic rules protection from an allergy may be provided at certain levels in patients with an allergic physique. In this way, the principle of prevention which is the basic aspect of preventive medicine is adopted with early precautions. It is important to increase the public consciousness on the issue and provoke resources (public, private sector, non-governmental organizations etc.). The beneficial impact of occupational and environmental control may be observed after a short period of time. The importance given to the politics of environmental control including the workplace has started to increase in new prevention strategies for allergic diseases. In this context, physicians, engineers, educators, community leaders, politicians and law enforcement officers have important missions together with patients. Conscious environmental protection will inhibit the progression of allergic diseases and decrease treatment costs which will also provide significant financial resources.

The reason for the recent increase in the prevalence of allergic diseases is still being debated. Detailed molecular studies and studies based on analytic epidemiology are needed to evaluate the pathology of these diseases and the effect of the occupational and environmental exposures on the immune system. Further epidemiologic studies investigating the relations between genetic and environmental factors (for example: chemicals in the workplace; indoor and outdoor air pollution, food preservatives etc.) in sensitive individuals will be helpful to better understand the etiology of the disease.

References


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