

Diseases caused by air pollution

I am a paediatrician providing treatment and preventative care for children aged 0 to 19 years. I work in Ostrava-Radvanice, which is a suburb of Ostrava city, situated in the near vicinity of the firm ArcelorMittal Ostrava.

Development of morbidity rate

- The morbidity rate in this locality has always been high, and diseases of the respiratory tract, generally known as the common cold, have always played a role.
- During the 1990's, the situation improved after the introduction of new ecological measures in manufacturing.
- Since the year 2000, the situation has again been steadily worsening

How the current situation differs from the past

- Breathing difficulties and diseases have always played a role. Previously, the diseases predominantly affected the upper respiratory tract, so we most frequently diagnosed sore throat, nasopharyngitis, tracheitis, and/or laryngitis and the diseases had a typical traditional course.
- Children were most ill during their preschool years after entering kindergarten – like anywhere else as this is associated with adaptation to collective and social life.
- During recent years, inflammatory diseases have been moving to the lower airways, they are more frequent and dangerous and absolutely unpredictable in medical terms.
- The diseases change over the course of several days and for the most part lack any pathology in laboratory tests.
- The number of severe conditions and complications is growing, especially in the youngest age category

Classification of smog-induced diseases by groups

1. Newborns
2. Short-term problems: frequently occurring common cold
3. Medium-term problems: allergies & asthma
4. Long-term problems: serious diseases & shortening of life expectancy

1. Newborns

Children born from the end of August until December, which means those conceived between November and February, are less adaptable than those born in the other months of the year.

Problems of newborns

- Intense, persistent neonatal jaundice
- Poorly healing navel
- Purulent eye discharge, blocked tear ducts
- Stubborn and severe eczema that does not respond to treatment
- Severe bloating, strong colicky abdominal pain
- Runny nose from time of birth until late spring
- Permanently increased phlegm production in the airways
- Long-term and repeated diarrhoea, very often with green and slimy stools, frequently with traces of fresh blood
- The children are restless, permanently prone to cry, inconsolable, look like they are in pain, and cry all day and night long
- Duration – 6 weeks to 3 months

Occurrence of pneumonia in these newborns

- Date of conception – November to February
- Date of birth – August to December
- Children born in this period are very likely to suffer either strong bronchitis or even pneumonia during the first winter of their life, very often even several times during the first months of their life

2. Short-term problems – frequent colds

Direct relation between diseases of the respiratory tract and smog

- Is already absolutely clear.
- Doctor Šrám reports that bronchitis (inflammation of the main air passages to the lungs) lasts up to one week in patients in the Czech Republic, while I see duration of 2 to 3 days among my patients in my office.
- This indicates to me that children are healthy for several days and then ill for several days, a cycle that repeats itself from the end of October until the end of February.

Clinical symptoms caused by smog, which are also related to adult and otherwise healthy individuals

- Profuse watery nasal discharge, chaffing under the nose
- Tearing, burning eyes, purulent conjunctivitis, sometimes with traces of blood
- Strong burning in the throat, simulating a sore throat
- A hacking, non-productive, painful, barking cough
- Bloating, abdominal pain, slimy diarrhoea
- Burning and itching of non-covered skin, eczema

Other problems suffered by older children, adolescents and adults

- Tiredness to fatigue syndrome
- Dizziness and headaches
- Joint pain
- Burning and pressure behind the sternum
- Feelings of strong discomfort or depression resulting from frequent and recurring problems and futility of any treatment

How these diseases differ from common diseases

- Diseases are without fever.
- Laboratory, bacteriological, serological and immunological examinations are almost always negative, including severe problems.
- Breathing difficulties and diseases recur several times during the winter, always related to a worsening of the smog situation.
- These diseases have a very abrupt onset – especially in infants, the children have a runny nose for one day, and for the next 2 to 3 days they are short of breath and have positive X-ray findings.

Difficult clinical diagnosis

- High similarity with common diseases of the respiratory tract.
- The body responds to any potentially harmful agent in a similar way (inflammatory reaction) regardless of whether it is a virus or dust or pollen.
- In addition to mechanical effects, which damage the mucosa, chemical effects are also involved, the dust is not clean as it binds other substances, mainly polycyclic aromatic hydrocarbons, which are carcinogenic and mutagenic and damage the affected mucosa.

- Damaged mucosa is secondarily colonized by viruses and bacteria and the problems turn to a vicious circle of never-ending illnesses.

Changes in blood test results not previously seen

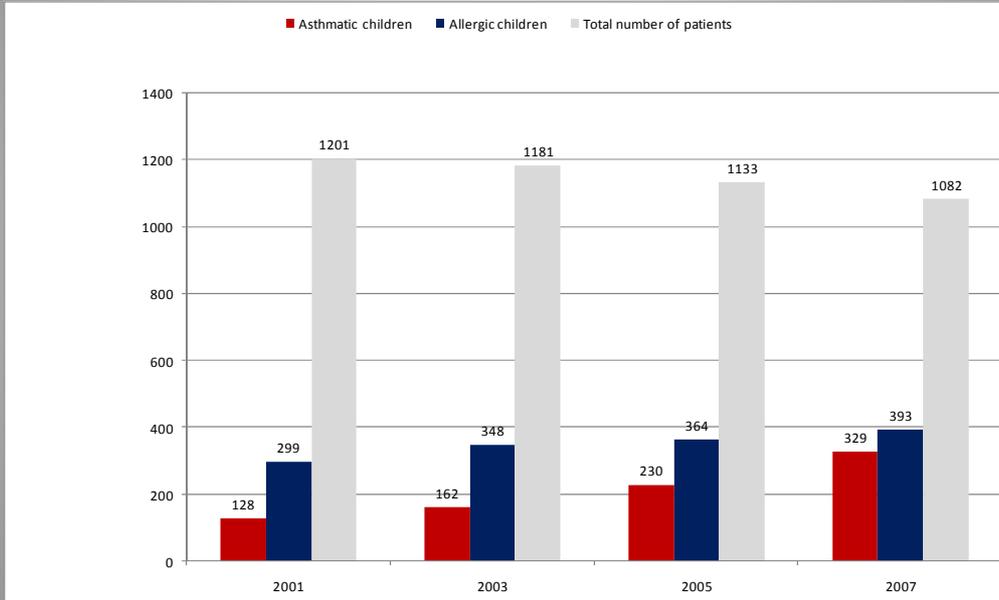
- During the winter we repeatedly face mild changes in blood coagulation factors, and although these changes are minor (for example approximately 10% change), and the children have no apparent bleeding, they make us postpone scheduled surgeries until the late spring.
- In recent years, the number of children with confirmed marked anaemia due to a lack of iron has increased threefold.
- This condition requires much longer treatment than several years ago.
- We believe that this is an acute impact of these dust-bound pollutants, probably of the benzene and benzo(a)pyrene type

3. Medium-term impact on health

- The most frequently occurring symptoms are allergies and asthma
- The number of asthmatics among children in our regions is four times higher than in the remaining parts of the Czech Republic
- Asthma develops very early in our children, from the toddler's age
- This is a very severe, and absolutely untypical asthma, known as chemical asthma
- Children must be treated with corticosteroids much earlier and for much longer

Statistics 2001-2007

Eva Schallerova MD



4. Impact of air pollution on health

- Increase in all types of serious diseases
- Cardiovascular diseases
- Cancer
- Shortening of life expectancy, which is more apparent in men

Mean life expectancy at birth – men

