Air pollution increases heart attacks

October 7 2013

Air pollution increases heart attacks, according to research presented at the Acute Cardiac Care Congress 2013 by Dr Savina Nodari from Brescia, Italy. The Acute Cardiac Care Congress 2013 is the annual meeting of the Acute Cardiovascular Care Association (ACCA) of the European Society of Cardiology (ESC). It takes place 12-14 October in Madrid, Spain.

Dr Nodari said: "In the last few decades there has been a worrying increase in air pollution. Regardless of local environmental and social policies to approve air quality, the negative effect of air pollution continues to be an important public health problem."

She added: "Some studies conducted in Europe and the US have reported an association between air pollution, especially fine and ultrafine particles which are measured as particulate matter (PM) 10, and not only respiratory disease but also acute cardiovascular events and deaths. The European Union has set a PM10 safety threshold of 50 micrograms/m^3 but the negative effect of PM10 on the cardiovascular system may occur at levels lower than this cut off."

The current study set out to confirm the association between levels of PM10, which is a marker of general air pollution, and the risk of acute cardiovascular events. It also examined individual susceptibility to cardiovascular events during high PM10 levels. Data was collected on daily hospitalisations for cardiac events (acute coronary syndrome, acute heart failure, malignant ventricular arrhythmias and atrial fibrillation) and average daily concentrations of PM10 in Brescia during 2004 to

2007.

The study found a significant association between PM10 levels and admission for acute cardiovascular events such as acute coronary syndromes, heart failure, worsening heart failure, paroxysmal atrial fibrillation and ventricular arrhythmias. The effect was linear, with a 3% increase in admissions for every 10 microgram increase in PM10.

Dr Nodari said: "Brescia is one of the most industrialised areas in the North of Italy and according to the European Environmental Agency it has average daily PM10 levels higher than the safety threshold of 50 micrograms/m^3. This high level of air pollution is clearly having a bad effect on heart health."

The researchers also found that older people (>65 years) and men were particularly susceptible to having arrhythmias, atrial fibrillation or acute coronary syndromes at increasing levels of air pollution. Dr Nodari said: "This may be related to a higher prevalence of comorbidities and greater fragility of the cardiovascular and circulatory system associated with ageing."

Another finding was that cardiovascular hospitalisation during a higher level of PM10 occurred more often in patients who had previously been hospitalised for a cardiovascular event. Dr Nodari said: "We need to pay particular attention to protecting patients who are older and who have had a previous heart attack or other heart problem, as they are more vulnerable to having another cardiac event."

She added: "Previous studies support the hypothesis that air pollution may increase cardiovascular event rates because PM10 can induce processes that are bad for the heart including inflammation and coagulation."

Dr Nodari continued: "Air pollution is a big problem because we can't protect people if we are unable to improve the air quality where they live. To protect public health, national policies need to consider other sources of energy for cars, industry and domestic use which may include electricity, wind energy, photovoltaic systems or nuclear energy. Many people think nuclear energy is not a good alternative and I agree, but we have such high levels of air pollution now that we have to seriously look at the alternative options."

She concluded: "The current PM10 threshold of 50 micrograms/m^3 is too high because at this level we observed an increase in hospitalisations for heart diseases. The cut off should be reduced to 20 - 30 micrograms/m^3, or even less if possible, because like cholesterol the risk is continuous – the higher the levels the greater the risk. If we can obtain a lower level of PM10 probably we will lower the risk of heart disease."

Provided by European Society of Cardiology