

HEART

Air pollution linked to irregular heartbeat and lung blood clots

But picture less clear for impact on heart attack and stroke risk, large study finds

Research: [Short term effects of air pollution on a range of cardiovascular events in England and Wales: case cross-over analysis of the MINAP database, hospital admissions and mortality Online First doi 10.1136/heartjnl-2013-304963]

Linked editorial: [Less clarity as the fog begins to lift Online First doi 10.1136/heartjnl-2014-305877]

Air pollution is linked to an increased risk of developing an irregular heartbeat - a risk factor for stroke - and blood clots in the lung, finds a large study published online in the journal Heart.

But its impact on directly boosting the risk of heart attacks and stroke is rather less clear, the research indicates.

The evidence suggests that high levels of certain air pollutants are associated with a higher risk of cardiovascular problems, but exactly how this association works has not been clarified.

The research team therefore set out to explore the short term biological impact of air pollution on cardiovascular disease, using data from three national collections in England and Wales for the period 2003-9.

These were the Myocardial Ischaemia National Audit Project (MINAP), which tracks hospital admissions for heart attack/stroke; hospital episode statistics (HES) on emergency admissions; and figures from the Office of National Statistics (ONS) on recorded deaths.

Some 400,000 heart attacks recorded in MINAP; more than 2 million emergency admissions for cardiovascular problems; and 600,000 deaths from a heart attack/stroke were linked to average levels of air pollutants over a period of 5 days using data from the monitoring station nearest to the place of residence.

Air pollutants included carbon monoxide, nitrogen dioxide, particulate matter (PM10 and PM2.5), sulphur dioxide, and ozone. Information on ambient daily temperatures, recorded by the UK Meteorological Office, was also factored in.

No clear link with any air pollutant was found for cardiovascular deaths, with the exception of PM2.5 which was linked to an increased risk of irregular heart rhythms, irregular heartbeat (atrial fibrillation) and blood clots in the lungs (pulmonary embolism).

Only nitrogen dioxide was linked to an increased risk of a hospital admission for cardiovascular problems, including heart failure, and an increased risk of a particular type of heart attack (non-ST elevation) in the MINAP data.

The findings prompt the researchers to conclude that there is no clear evidence implicating short term exposure to air pollution in boosting the risk of heart attacks and stroke.

But there does seem to be a clear link between particulate matter levels and heightened risk of atrial fibrillation and pulmonary embolism, they say.

In an accompanying linked editorial, cardiologists from the University of Edinburgh, point out that globally particulate matter is thought to be responsible for more than 3 million deaths around the globe, primarily as a result of heart attacks and stroke.

They go on to point out that patients who sustain a non-ST elevation heart attack generally tend to be older, which may implicate air pollution as being particularly harmful for elderly people.

Nevertheless, they agree that the picture is somewhat muddled and may also be affected by improving air quality, overall.

“The current lack of consistent associations with contemporary UK data may suggest that as the fog begins to clear, the adverse health effects of air pollution are starting to have less of an impact and are more difficult to delineate,” they conclude.