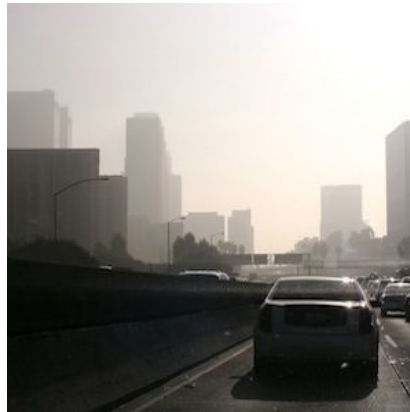




## Pollution Increases Risk of CVD



According to research presented at the ESC Congress in London, young adults living in a polluted city show early signs of cardiovascular risk.

The research was presented by Dr Krzysztof Bryniarski from Jagiellonian University, Collegium Medicum in Krakow, Poland. The findings suggest that living in a polluted city was associated with higher levels of inflammatory markers in otherwise healthy adolescents and young adults, which indicate a greater risk of having a heart attack in future.

Dr Bryniarski said: "This study was conducted by a group of medical students from Jagiellonian University in Krakow, supervised by Professors T. Guzik and A. Wysokinski, who wanted to know what impact long term air pollution is having on the cardiovascular health of young adults. Krakow is one of the most polluted cities in Europe. We decided to compare some markers of cardiovascular risk in our city with risk in Lublin, which has similar general demographic characteristics but much lower traffic congestion and two fold lower air pollution."

The current study assessed the association between long term air pollution exposure and blood pressure and inflammatory markers in Krakow and Lublin, two large Polish cities each with more than 300 000 inhabitants. It included 826 randomly selected healthy young adults aged 16 to 22 years (average age 18), of whom 444 lived in Krakow and 382 lived in Lublin. Participants came from similar types of schools and social backgrounds and had lived in their home city since birth.

The researchers measured blood pressure, heart rate and blood levels of inflammatory markers including C-reactive protein (CRP), high sensitivity CRP (hsCRP), homocysteine and fibrinogen which are early indicators of cardiovascular disease. They also assessed numerous potential confounding factors such as body mass index (BMI), lifestyle, ethnicity and family history.

Data on air pollution was obtained from air quality monitoring stations. Average 10 year air pollution levels were nearly double in Krakow compared to Lublin. Average PM2.5 levels for example were 41.7  $\mu\text{g}/\text{m}^3$  in Krakow and 22.4  $\mu\text{g}/\text{m}^3$  in Lublin while PM10 was 56.9  $\mu\text{g}/\text{m}^3$  in Krakow and 29.4  $\mu\text{g}/\text{m}^3$  in Lublin.

The investigators found significantly higher levels of CRP, hsCRP, homocysteine and fibrinogen levels in Krakow residents compared to Lublin residents ( $p < 0.0001$  for all). The highest levels of these inflammatory markers was found in overweight (BMI 25-37  $\text{kg}/\text{m}^2$ ) participants living in Krakow. "Our study shows that young adults living in a polluted city have higher levels of inflammatory markers than those living in a city with less pollution," said Dr Bryniarski. "This may suggest that these young adults are at greater risk of having a heart attack in future as the inflammatory process has already started."

There were no major differences in subjects' blood pressure between the two cities, nor were there differences in smoking, physical activity levels, BMI, age or other confounding factors.

Dr Bryniarski concluded: "We have shown that living in a highly polluted city can have an impact on cardiovascular risk markers even at an early age. This may occur through chronic low grade inflammation. This is the first study to establish a link between residence in a city with very high air

pollution and cardiovascular risk in young adults, in whom cardiovascular risk is typically not yet considered and who have not had contact with health services before.”

Source: [ESC](#)

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