

Childhood cholesterol, blood pressure, weight and smoking predict adult heart disease

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The first reliable evidence of a link between major cardiovascular risk factors in children—serum cholesterol, blood pressure, body mass index (BMI), and smoking—with cardiovascular disease in adults is presented today at ESC Congress 2019 together with the World Congress of Cardiology. The study highlights the need to lay the foundations for heart health early in life.

Study author Professor Terence Dwyer of the University of Oxford, UK, said: "While previous research has found connections between smoking and BMI in childhood and adult [cardiovascular disease](#), there was no data for [blood pressure](#) or serum cholesterol. In addition, it has not been possible to assess the contributions of BMI and smoking while taking cholesterol and blood pressure into account."

The study used data from the International Childhood Cardiovascular Cohort (i3C) Consortium. Data was pooled on [serum cholesterol](#), blood pressure, BMI, and smoking from seven child cohorts in the US, Australia, and Finland. Information was collected from 1971 onwards on approximately 40,000 children aged 3 to 19 who were followed up at around age 50 for cardiovascular events leading to hospitalisation ([heart attack](#), stroke, peripheral arterial disease) or all-cause death.

Hazard ratios for cardiovascular events were calculated for each risk factor separately, and for all risk factors simultaneously. The latter analysis estimated how important each risk factor might be when all the others are taken into account.

For cardiovascular events leading to hospitalisation, the associations for risk factors were:

- BMI: 10% rise → 20% higher risk of an event.
- Systolic blood pressure: 10% rise → 40% higher risk of an event.
- Serum cholesterol: 10% rise → 16% higher risk of an event.
- Adolescent smoking → 77% higher risk of an event.

In the simultaneous analysis of risk factors, the associations with future risk were reduced, suggesting a shared contribution to risk by each, although the smoking association remained relatively unchanged. The associations for death were very similar to those found for [cardiovascular events](#).

Prof Dwyer said: "The study shows a very [strong relationship](#) between standard cardiovascular [risk factors](#) in children and the probability of a heart attack or stroke later in life. A meaningful proportion of that risk appears to be laid down in childhood and has a detrimental effect independent of adult risk factor levels. Programmes to prevent heart attacks and strokes should put more emphasis on promoting healthy lifestyles in children."

More information: "Childhood risk factors and cardiovascular disease outcomes in adulthood. Preliminary findings from the International Childhood Cardiovascular Cohort (i3C) Consortium" ESC Congress 2019 together with the World Congress of Cardiology.

Provided by European Society of Cardiology

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