Medical Xpress

COVID-19: Hospitalization significantly higher for those overweight

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People who are overweight, even if only modestly, are at greater risk of COVID-19 hospitalization, finds a new study led by UCL researchers.

For the study, published in the *Proceedings of the National Academy of*

Sciences, researchers assessed UK Biobank data of more than 330,000 UK residents, taken between 2006 and 2010.

The data set includes individuals' body mass index (BMI), waist hip ratio, along with other covariates relating to age, ethnicity, alcohol intake, smoking and physical activity.

Further information relating to cardio-vascular disease, diabetes, hypertension, and a blood sample containing disease biomarkers, cholesterol, high-density lipoprotein cholesterol, glycated hemoglobin, and C-reactive protein, was also available.

Researchers then linked this to Public Health England data on COVID-19 hospitalisations covering the period from 16 March 2020 up to 26 April 2020. During this period, testing was restricted to those with symptoms in hospital, therefore the study represents severe COVID-19.

They found 640 people (0.2%), from the UK Biobank large population sample, were admitted to hospital after contracting the virus and discovered a link between hospitalization and increased BMI. A BMI of 25-30 is considered overweight and a BMI of 30 and above is considered obese.

Researchers found those with a BMI over 25, had a 40% higher risk of hospitalization after taking into account age and sex—two independent risk factors for COVID-19.

For those in the obese category, BMI 30 plus, the risk was 70% higher. And those in the severe obese category (BMI more than 35), the odds of hospitalization more than doubled.

Lead author Professor Mark Hamer (UCL Surgery & Interventional Science) said: "In statistical models we found there was a linear increase

in the risk of COVID-19 hospitalization with increasing BMI.

"This was evident from those overweight, even if only slightly, through to severe obesity, when compared to those of normal weight. A similar finding was found for waist-to-hip ratio."

The findings build on previous smaller-scale studies which have examined the potential link between being obese and progressing to intensive care due to coronavirus infection.

Professor Hamer added: "Since over two-thirds of Westernized society are overweight or obese, this potentially presents a major risk factor for severe COVID-19 infection and may have implications for policy."

The research, done in collaboration with researchers at the universities of Southampton and Edinburgh, also tried to identify the possible biological mechanisms, which causes this elevated risk.

Disease biomarkers, particularly high-density lipoprotein cholesterol ("good" fat in blood) and glycated hemoglobin (marker of glucose regulation in blood), increased the likely hood of hospitalization.

Professor Hamer said: "The impaired glucose and lipid metabolism (how the body uses types of fat and sugar) appears to be a plausible cause: the links between obesity and COVID-19 infection may be more complex than simple mechanical aspects of excess fat on the diaphragm."

More information: Mark Hamer et al. Overweight, obesity, and risk of hospitalization for COVID-19: A community-based cohort study of adults in the United Kingdom, *Proceedings of the National Academy of Sciences* (2020). DOI: 10.1073/pnas.2011086117