

Obesity increases the risk of fetal and infant death, and the risk of complications after hysterectomy

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Women who are obese during early pregnancy have a significantly increased risk of their baby dying before, during or up to one year after birth, according to research published in Europe's leading reproductive medicine journal *Human Reproduction* today [1]. A second paper [2] also published in the journal today shows that obesity increases the risk of complications, such as bleeding and infections, during and after a hysterectomy operation.

In the first paper, researchers from Newcastle University, UK, studied 40,932 pregnancies involving deliveries of single babies during 2003 to 2005 at five maternity units in the north of England. They found that women who were obese in [early pregnancy](#) had nearly double the risk of the baby dying in the womb (foetal death [3]) or up to one year after birth (infant death) than women who were of recommended weight.

The study estimated there were nearly eight more foetal and infant deaths per 1000 births among [obese women](#) than among women of the recommended [body mass index](#) (BMI). The total (absolute) risk among obese women was 16 in every 1000 births (1.6%) compared to nearly nine per 1000 births (0.9%) in normal weight women. Obese women were categorised as having a BMI of 30 kg/m² or more, while women of recommended weight had a BMI of between 18.5-24.5 kg/m².

Dr Ruth Bell, clinical senior lecturer in the Institute of Health and

Society at Newcastle University and associate director at the Regional Maternity Survey Office (RMSO), said: "It's important to remember that most women in the UK will deliver a healthy live baby, regardless of their weight at the start of pregnancy. What's key is that women should be helped to achieve a healthy weight before they become pregnant or after the baby is born. Our research shows that this will give the baby the best possible start in life. Women should not try to lose weight during pregnancy, but should ensure they eat a balanced [healthy diet](#)."

The researchers also examined BMI as a continuous variable, discovering a V-shaped pattern of risk, with the lowest risk among women with a BMI of 23, and increased risk at higher and lower BMIs.

Co-author Peter Tennant, research assistant at Newcastle University, said: "We are the first investigators to examine the continuous relationship between BMI and foetal and [infant deaths](#). Our study suggests the optimal BMI, for the child at least, is somewhere around 23, but further research is needed to confirm this."

One reason for the increased risk of foetal and infant death in obese women was due to a higher proportion of deaths due to pre-eclampsia, a serious pregnancy complication characterised by high blood pressure and protein in the urine. However deaths due to other causes were also more common in obese women.

Co-author Professor Judith Rankin, professor of maternal and perinatal epidemiology at Newcastle University and academic director at the RMSO, explained: "There are likely to be a number of reasons why obesity is associated with foetal and infant death and we don't yet know the full story. For example, there is an increased risk of high blood pressure or diabetes developing during pregnancy. Understanding the risks associated with obesity is helpful for healthcare professionals caring for pregnant women, so that additional monitoring can be

provided as necessary."

The researchers adjusted their results to take account of the mothers' age, ethnicity, smoking status, socioeconomic status, and for the birth weight and gestational age of the babies, and excluded pregnancies where the baby had a congenital anomaly (e.g. spina bifida) or where the mother had a history of diabetes – both of which are associated with maternal obesity and increase the risks of foetal and infant death.

One limitation, however, was that the study used weight and height information reported by the women and not measured by health professionals. Dr Bell said: "It is important that all women should have their weight and height measured – not self reported – at the start of their pregnancy and that this is recorded in hospital systems."

The study used information collected routinely during the women's antenatal visits, and so could not examine whether lifestyle factors such as diet, exercise, alcohol and caffeine consumption influenced pregnancy risks.

Concluding their paper, the authors warn: "Given the rising prevalence of obesity in the population of pregnant women, the rates of miscarriage, stillbirth and infant mortality can be anticipated to increase." Further research is underway by the team to understand how to reduce these risks.

The second study by researchers in Denmark looked at data from 20,353 women who had undergone hysterectomy for benign indications such as abnormal (usually heavy or irregular) bleeding during menstruation, fibroma (benign muscle tumours) and pain between January 2004 and December 2008.

They found that women with a BMI of 30 kg/m² and over had a more

than three-fold increased risk of heavy bleeding during surgery when compared to women of the recommended BMI, which they defined as being between 20-25 kg/m². The obese women also had an increased risk of all bleeding complications (bleeding either during or after the operation, or haematoma – a collection of blood where bleeding has occurred), and infection; the increased risks were approximately a third and a half higher respectively. However, when Professor Merete Osler and her colleagues looked more closely at the data, they found that some of this increased risk depended on the route of surgery.

"We found that the increased risk of all bleeding complications and infection associated with a high BMI were only seen in women who underwent an abdominal hysterectomy, and it was not seen in those who had either a vaginal or laparoscopic hysterectomy. Obese women who had an abdominal hysterectomy had one and a half times the risk compared with women of the recommended BMI," said Prof Osler, who is a consultant physician and professor of clinical databases in the Research Centre for Prevention and Health at Glostrup University Hospital (Glostrup, Denmark).

The researchers found a U-shaped curve to their results. Underweight women (defined as those with a BMI under 20) had the highest risk of all bleeding complications (nearly half as high again) and a two-thirds higher increased risk of re-operation. When the researchers looked at these results with regard to the route of surgery they found that underweight women had an increased risk of infection of two and a half times that of women of the recommended BMI if the surgery had been laparoscopic. If they had an abdominal hysterectomy, they also had a fifth higher risk of all complications, and the risk of all bleeding complications increased by a half.

"Low BMI does appear to be a risk factor," said Prof Osler.

"Interestingly, being overweight, with a BMI between 25-30 does not

seem to be associated with increased risks, apart from heavy bleeding where there is a two-fold risk. In fact, overweight women seem to have the lowest risk of all complications and re-hospitalisation and re-operation."

The researchers say the association with bleeding and infection in obese women might be explained by larger wound surfaces. In underweight women, the association with bleeding might be because fatty tissue in moderate amounts might have a protective effect and so its absence could adversely affect bleeding and also impair wound healing. The association between laparoscopic hysterectomy and an increased risk of infection in underweight women could be a chance finding due to the small number of cases.

Prof Osler concluded: "Our results suggest that, whenever possible, obese women should have a vaginal or laparoscopic hysterectomy for benign indications, while underweight women should have a vaginal hysterectomy, in order to avoid the increased risks identified in our study."

More information: [1] "Maternal body mass index and the risk of fetal and infant death: a cohort study from the North of England", by P.W.G. Tennant, J. Rankin, and R. Bell. Human Reproduction journal. [doi:10.1093/humrep/der052](https://doi.org/10.1093/humrep/der052)

[2] "Body mass and risk of complications after hysterectomy on benign conditions", by Merete Osler, Signe Daugbjerg, Birgitte Lidegaard Frederiksen, and Bent Ottesen. Human Reproduction journal. [doi:10.1093/humrep/der060](https://doi.org/10.1093/humrep/der060)

[3] Foetal death included miscarriages and stillbirths any time from 20 weeks gestation onwards.

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