

Sperm size and shape in young men affected by cannabis use

4 June 2014



Young men who use cannabis may be putting their fertility at risk by inadvertently affecting the size and shape of their sperm according to research published today.

In the world's largest study to investigate how common lifestyle factors influence the size and shape of [sperm](#) (referred to as [sperm morphology](#)), a research team from the Universities of Sheffield and Manchester also found that sperm size and shape was worse in samples ejaculated in the summer months but was better in [men](#) who had abstained from sexual activity for more than six days.

However, other common lifestyle factors reported by men, including smoking cigarettes or drinking alcohol, appeared to have little effect.

The study, published in the medical journal *Human Reproduction*, recruited 2,249 men from 14 fertility clinics around the UK¹ and asked them to fill out detailed questionnaires about their medical history and their lifestyle.

Reliable data about sperm morphology was only available for 1,970 men and so the researchers compared the information collected for 318 men who produced sperm of which less than four per

cent was the correct size and shape and a control group of 1,652 men where this was above four per cent and therefore considered 'normal' by current medical definitions.

Men who produced ejaculates with less than four percent normal sperm were nearly twice as likely to have produced a sample in the summer months (June to August), or if they were younger than 30 years old, to have used cannabis in the three month period prior to ejaculation².

Lead author Dr Allan Pacey, Senior Lecturer in Andrology at the University of Sheffield, said: "Our knowledge of factors that influence sperm size and shape is very limited, yet faced with a diagnosis of poor sperm morphology, many men are concerned to try and identify any factors in their lifestyle that could be causing this. It is therefore reassuring to find that there are very few identifiable risks, although our data suggests that cannabis users might be advised to stop using the drug if they are planning to try and start a family."

Previous research has suggested that only sperm with good sperm morphology are able to pass into the woman's body following sex and make their way to the egg and fertilise it. Studies in the laboratory also suggest that sperm with poor morphology also swim less well because their abnormal shape makes them less efficient.

Dr Andrew Povey, from the University of Manchester's Institute of Population Health, said: "This research builds on our study of two years ago³ which looked at the risk factors associated with the number of swimming sperm (motile concentration) in men's ejaculates.

"This previous study also found that there were relatively few [risk factors](#) that men could change in order to improve their fertility. We therefore have to conclude again that there is little evidence that delaying fertility treatment to make adjustments to a

man's lifestyle will improve their chances of a conception."

Although the study failed to find any association between sperm morphology and other common [lifestyle factors](#), such as cigarette smoking or alcohol consumption, it remains possible that they could correlate with other aspects of sperm that were not measured, such as the quality of the DNA contained in the [sperm head](#).

Professor Nicola Cherry, originally from the University of Manchester but now at the University of Alberta, commented on a recent companion paper published by the group in the *Journal of Occupational and Environmental Medicine*⁴: "In addition to cannabis exposure shown in this paper, we also know that men exposed to paint strippers and lead are also at risk of having sperm with poor morphology."

More information: Paper: 'Modified and non-modifiable risk factors for poor sperm morphology' by AA Pacey et al, *Human Reproduction*, June 5, 2014.

Notes:

1 Participating centres were: Department of Obstetrics and Gynaecology, Queens University, Belfast; Assisted Conception Unit, Birmingham Women's Hospital; Division of Obstetrics and Gynaecology, St Michael's Hospital, Bristol; Directorate of Women's Health, Southmead Hospital, Bristol; Cardiff Assisted Reproduction Unit, University of Wales; MRC Reproductive Biology Unit, Edinburgh; Reproductive Medicine Unit, Liverpool Women's Hospital; St Bartholomew's Hospital, London; Department of Obstetrics and Gynaecology, Royal Free and University College, London; Department of Reproductive Medicine, St Mary's Hospital, Manchester; IVF/Immunology Laboratory, Salford Royal Hospital Department of Histopathology, University hospital of South Manchester; International Centre for Life, Newcastle; Department of Obstetrics and Gynaecology, Jessop Hospital for Women, Sheffield; Shropshire and Mid-Wales Fertility Centre, Royal Shrewsbury NHS Trust.

2 The study found that risk factors for poor sperm morphology, after adjustment for centre and other risk factors, included: (i) sample production in summer (odds ratio (OR) = 1.99, 95% confidence interval (CI) 1.43 - 2.72); and (ii) use of cannabis in the 3 months prior to sample collection in men aged >30 years (OR = 1.94, 95%CI 1.05 – 3.60). Men who produced a sample after 6 days abstinence were less likely to be a case (OR = 0.64, 95%CI 0.43 - 0.95). No significant association was found with BMI, type of underwear, smoking or alcohol consumption, or having a history of mumps.

3 See Povey et al., (2012) Modifiable and non-modifiable risk factors for poor semen quality: a case-referent study. *Hum Reprod* 17:2799-2806.

4 See Cherry et al., (2014) Occupational exposures and sperm morphology: a case referent analysis of a multi-centre study. *Occup Environ Med*. First published on 20th May 2014 as 10.1136/oemed-2013-101996

5 See Cherry et al., (2008) Occupation and male infertility: glycol ethers and other exposures. *Occup Environ Med*. 65: 708-714.

Provided by University of Sheffield

APA citation: Sperm size and shape in young men affected by cannabis use (2014, June 4) retrieved 24 July 2022 from <https://medicalxpress.com/news/2014-06-sperm-size-young-men-affected.html>

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