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Physically demanding jobs and shiftwork linked to lowered fertility in women

*Heavy lifting and evening/night/rotating shift patterns associated with poorer egg quality*

A physically demanding job or work schedules outside normal office hours may lower a woman's ability to conceive, suggests research published online in *Occupational & Environmental Medicine*.

Heavy lifting at work and evening/night/rotating shift patterns were associated with poorer egg quality, the findings show.

Previous research has linked occupational factors to fertility, measured in outcomes such as time to pregnancy and the ability to carry a pregnancy to term. But no study has assessed whether workplace factors might affect a woman's biological capacity to have a baby.

To try and address this, the research team looked at indicators of 'ovarian reserve' - the number of remaining eggs (antral follicle count) and levels of follicle stimulating hormone or FSH for short, which rise as a woman ages and represent dwindling fertility - in 473 women attending one fertility clinic.

And they also looked at ovarian response - the number of mature eggs capable of developing into a healthy embryo in 313 of the women who had completed at least one cycle of IVF by December 2015.

The average age of the women was 35, while their average BMI was 23, and they were all part of an ongoing (EARTH) study, which has been looking at environmental and dietary factors that might affect fertility since 2004.

The women were quizzed about the level of physical exertion required for their job and the hours and patterns worked, as well as leisure time physical and sedentary activities.

In all, four out of 10 women said that their job required them to regularly move/lift heavy objects, and around one in four (22%) said that their jobs were moderately to very physically demanding. Nine out of 10 (91%) worked during normal office hours.

The number of remaining eggs, revealed by ultrasound scan, ranged from 8 to 17 among all 473 women, while the average number of mature eggs retrieved from the 313 undergoing an IVF cycle was 9.

Type of workload did not seem to make any difference to FSH levels, but women with physically demanding jobs had a lower reserve of eggs than those whose work did not regularly require heavy lifting.

And compared with those whose jobs didn't entail heavy lifting, among women going through IVF, those with physically demanding jobs had a lower total reserve of eggs and fewer mature eggs, representing reductions of nearly 9% and nearly 14.5%, respectively.

These differences were greater among women working evening/night/rotating shifts: they had fewer mature eggs, on average, than those working shifts within normal working hours. And they were even greater among those specifically working evening and night shifts, possibly because of disruption to the body clock, suggest the researchers.

Women who were overweight (BMI of 25 and above) and whose job was physically demanding also had fewer mature eggs than those of the same weight who didn't have to do any heavy lifting at work; this discrepancy was larger than it was among lean women.

And a similar difference emerged between older (37 and above) and younger women.

"These findings have clinical implications, as women with fewer mature oocytes would have fewer eggs which are capable of developing into healthy embryos," write the researchers, who go on to add that the results "suggest that occupational factors may be more specifically affecting oocyte production and quality, rather than accelerating ovarian ageing."

This is an observational study, so no firm conclusions can be drawn about cause and effect, added to which the researchers were unable to assess the impact of other potentially influential factors, such as long working hours or switching between day and night shifts.

And the findings may not be generalisable to couples attempting to conceive naturally without medical assistance, they caution.

Nevertheless, their findings reflect those of similar studies, they say. "Taken together with our results, it appears that lower oocyte quality could be one pathway mediating the relationship between high frequency of moving or lifting heavy loads at work and reduced fecundity," they suggest.

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