

Working conditions and female reproductive health

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In this issue of *World Journal of Pediatrics*, Lin and co-workers report an interesting study on the effect of rotating shift work for female employees on childbearing and infant birth weight (page 129).^[1] In their study of female workers in a semiconductor factory, they found a significant lower birth rate among women working shifts compared to women on consisting day-time work. Furthermore, although gestational age of infants was similar, infants born to mothers working shifts had significantly lower birth weight than infants of mothers on consisting day-time work. The study is limited to one workplace only, and there are also other differences between the study groups such as level of education, history of smoking and potential exposure to other chemicals. Nevertheless, the study adds important knowledge to the fact that working conditions have significant effects on female reproductive health as well as on growth and development of the fetus.^[2,3]

Factors affecting female reproductive health have been an increasingly important research area. Over the last decade, the human population has crossed a historic, but so far largely unnoticed threshold.^[4] Before 1950 fertility rates of 2.1 children per woman, conventionally regarded as replacement level in conditions of low mortality, were virtually unknown. However, as a result of a worldwide decline in fertility rates, almost one-sixth of the world's population is now experiencing fertility rates below 1.5. Such low rates are seen in most of southern and eastern Europe and much of East Asia.^[5] More than half of the world's population is now probably living in regions with fertility rates less than replacement level.^[4]

There are probably a number of reasons for this development. With the increased participation of young and fertile women in the general working life, one of these reasons is definitely related to the effect working conditions can have on female health in general and on reproductive health in particular. It is well documented that shift work and sleep deprivation have significant effects on female hormonal status which in turn may be one of the reasons for such health effects.^[1,6,7] The present study by Lin and co-workers clearly illustrates this.^[1] The general stress of combining family life and household responsibilities with a full time job can also have negative impact on health and daily well being, particularly during pregnancy.

What can then be done to secure safe and healthy working conditions for fertile and pregnant women? In Norway 75% of pregnant women are now working, a large number in shift work, particularly within the health care system. Norwegian national regulations on working conditions for pregnant women have been implemented in *The Working Environment Act*.^[8] One main paragraph deals with the woman's right to be transferred to lighter or less stressful jobs during pregnancy, such as being transferred from shift work and night work to continuous daytime work. As pointed out by Lin et al,^[1] such replacement during pregnancy was also a possibility for their women. However, due to a substantial loss of salary when changing from shift work to continuous daytime work, this possibility was not considered by many of the women. Although the Norwegian act has no paragraph on economic compensation for such job changes during pregnancy, most workers unions have negotiated such salary compensation with their employers, particularly within the health care system. Thus, most pregnant women in Norway are entitled to their full original salary when transferred from shift work to daytime work during pregnancy. However, in many workplaces, particularly small companies with few employees, change of work is not possible during pregnancy. In such cases intermittent or continuous sick leave is another possibility to reduce physical or other stress during pregnancy. *The Working Environment Act* states that when a pregnant woman is called sick, the employer is fully compensated for her salary from day one, whereas he ordinarily will have to pay for the first sixteen days

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of any sick leave period. After delivery, the mother is also entitled to one year leave from her job with almost full salary paid by the government. Such regulations not only support employers to hire young (and sometimes pregnant) women, but is probably also related to the fact that the fertility rate in Norway now is the highest in Europe.

Shift work and otherwise stressful jobs are not the only factor affecting female reproductive health. The tendency for women to postpone their pregnancies because of education and career plans is probably just as or even more important. Because of the normal reproductive ageing, the possibility of getting pregnant is considerably reduced also in relatively young women. Compared to a woman of 20 years, sub-fertility is seen in 10% of women at 25, 50% at 31, and 80% at 35 years of age even with normal menstrual cycles.^[9] It might also be speculated that this normal reproductive ageing might be accentuated in women with shift work and otherwise stressful working conditions.

In the time with worldwide decreased fertility rates, action must be taken both by government and employers to ease working conditions for female workers, particularly during pregnancy. The present work by Lin and co-workers as well as works from other groups point to important factors which should be possible to deal with and improve.

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