**NIGHT SHIFT WORKERS HAVE 51% INCREASED BREAST CANCER RISK**

Professor Gordon Wishart, Professor of Cancer Surgery and Medical Director of HealthScreen UK reviews the research and how to manage the risks.

**Occupational cancer risk**

A recent initiative by the UK Health & Safety Executive (HSE) has been investigating occupational cancer risk in the UK and Europe. This has been a collaborative project between Imperial College London, The Institute of Occupational Medicine, The Institute of Environment & Health and the Health & Safety Laboratory. Following two HSE-sponsored workshops in 2004 & 2006, a panel of national and international experts agreed the methodology to define the incidence of occupational cancer risk in the UK. Their findings, recently published in a special edition of the British Journal of Cancer (1), show that 8% of all cancer deaths are due to occupational exposure to one or more carcinogens.

**Risk factors**

Although many risk factors for breast cancer have been established, what lies behind the rising incidence of breast cancer in developed countries? Firstly, it has been recognised for many years that breast cancer rates are higher in more affluent (richer) populations. With increasing affluence comes a rising trend in obesity and alcohol consumption, which are now both acknowledged risk factors for breast cancer.

Currently obesity in postmenopausal women is linked to breast cancer risk as a result of increased production of oestrogen in fatty tissue. The more fat, the more oestrogen, leading to the increased risk. The same link between obesity and breast cancer has not been found in premenopausal women but, many obese premenopausal women go on to have problems with obesity when they are postmenopausal. So the risk can start at an early age. There is now a great deal of research evidence linking alcohol to breast cancer risk in women. The risk is proportional to the amount of alcohol consumed, and with an epidemic of binge drinking in teenagers and young adults, the incidence of breast cancer is likely to rise for some time.

As well as these established risk factors for breast cancer, a number of environmental and occupational risk factors have been identified including radiation, exposure to chemicals including organochlorines & pesticides and shift work.

**Night shift work**

The most striking evidence for an occupational link to breast cancer however, is that shift work is now recognised as a carcinogen for breast cancer (2). Nurses and flight personnel are two of the groups that have been studied in relation to shift work and breast cancer risk. During the last 20 years there has been a significant rise in female shift work, and 30% of women now have a shift pattern that involves night work. It has been recognised for some time that exposure to light at night alters circadian (biological) rhythms that lead to genetic changes in key cancer pathways.

Based on a meta-analysis of six studies that have looked at night shift female workers (excluding flight personnel), it has been shown that the average increased risk is 51% (range 36-68%) above normal risk (2). The highest risks occur in those women with the longest exposure to night shift. With an average UK lifetime breast cancer risk of 12.5% (1 in 8 women), this increases to 19.5% (1.56 x 12.5%) with prolonged night shift work.

It is now thought that up to 5% of all breast cancer cases are caused by night shift work. In the UK, with nearly 50,000 newly diagnosed cases per annum now, this means that up to 2,500 new cases each year are being caused by an avoidable risk factor.

**Flight personnel**

A number of studies have shown that flight personnel have an increased risk of breast cancer, and possible contributing factors include shift work and exposure to ionising radiation. In the recent publication by Slack et al (2), a meta-analysis of studies in flight personnel (3) has shown an increased risk of 44% (range 26-65%), increasing the average breast cancer risk to 18% (1.44 x 12.5%). The increased figure of 44% is very similar to the increased risk for night shift work (51%) suggesting that this may be the most important contributing factor for flight personnel.

Of course, not all women have an average breast cancer risk. Based on their family history, reproductive history and lifestyle some women may have a baseline lifetime risk as high as 30%. For these women the addition of an additional risk factor, by working as flight personnel for a number of years, may increase their risk to as high as 43% (30% x 1.44).

**State compensation for night shift work**

In Denmark, The National Board of Industrial Injuries which is an agency of the Ministry of Employment has confirmed that since 2009, it has been paying compensation claims from women night shift workers diagnosed with breast cancer including flight attendants, nurses and soldiers (4). Each case is treated on its merits and to qualify for state compensation, a female shift worker must have worked for a...
minimum of 20 years with at least one night shift per week. In 2011, 38 out of 75 cases were approved for compensation. The year before, it was 24 out of 28.

At the time that the issue of Danish State compensation came to light, the HSE in the UK did not consider the evidence so compelling (5) that preventative action should be taken in workplaces but outlined that it was planning a two year project to look at night shift work resulting in the 2012 publication (2).

A personal injury specialist in 2009 said a woman would need to show that her employer had failed to protect her health and the main issue would be whether the courts would be prepared to make a finding when the women had consented to working night shifts. In light of the recent publications in the British Journal of Cancer, the evidence is now compelling and employers will need to consider how best to manage the increased breast cancer risk for night shift workers.

References

RISK MANAGEMENT FOR NIGHT SHIFT EMPLOYEES

1. Personal online risk assessment with Tyrer-Cuzick (T-C) model

   If moderate or high risk with T-C risk assessment consider:
   
   (a) Informing existing employees of the additional risk of breast cancer and advising new employees that they may be taking on an unnecessary risk as night shift personnel.
   (b) Asking employee to sign waiver saying they understand and accept the additional risk.
   (c) Consider employee for alternative role.

2. Education with presentations, leaflets, web-based information

3. BreastCheck
   • 20-minute consultation with specialist nurse
   • Discussion of personal breast cancer risk
   • Discussion of risk reduction strategies
   • Tuition in breast self-examination
   • Clinical breast examination
   • Personal breast screening program recommendation

4. Screening mammography
   Age 40-49 Annual screening mammogram
   Age 50-69 Screening mammogram every two years

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