MedicalXpress

Limited evidence that styrene, a high volume plastics chemical and animal carcinogen, causes cancer in humans

February 14 2017

In 2011, the styrene, a high volume plastics chemical and animal carcinogen, was the focal point in a 'poison scandal' in the Danish media; but now a registry study of more than 72,000 employees from more than 400 companies that have been exposed to styrene during production of glassfibre reinforced plastics, has not found an increased incidence of a wide range of cancer types. The Department of Occupational Medicine at Aarhus University is behind the study.

Employees in the glass fibre reinforced plastics who have worked with the chemical styrene do not have - as previously feared - an increased incidence of cancer of the oesophagus, pancreas, lungs, kidneys, bladder or a wide range of other types of cancer. On the other hand, they may possibly have an increased risk of developing what is known as myeloid leukaemia and nasal and paranasal cancer.

This is the conclusion of the most comprehensive study so far, which has been prepared by the Department of Occupational Medicine at Aarhus University. The study was recently published in the American scientific journal *Epidemiology*. It covers 72,292 employees who worked for one of the 443 small and medium-sized companies in Denmark that have used styrene for the production of e.g. wind turbines or pleasure boats during the period 1968-2012.

The Danish survey was initiated by a 'poison scandal' back in 2011,

where the Danish newspaper Berlingske Tidende gave voice to 20 former employees of the company LM Wind Power in Lunderskov near Kolding (formerly LM Glasfiber). All of the employees were seriously ill, allegedly due to interaction with styrene, which was used in windmill production.

They reported everything from inflamed boils the size of golf balls to respiratory problems, memory loss and fear of cancer, providing what was - together with the subsequent political debate, including discussions about completely prohibiting styrene - an obvious starting point for investigating the long-term effects, explains professor at the Department of Occupational Medicine at Aarhus University, Henrik A. Kolstad:

"Via several national registers we have identified the relevant companies and their employees, before coupling this information with the Danish Cancer Register. We have thus compared occurrences of different types of cancer in 72,000 employees, against the risk of these diseases in the general population who have not come into contact with styrene," says Henrik A. Kolstad.

"It is important to know for present and former workers exposed to styrene that they are unlikely to have become ill by doing their job, if they have developed cancer of the oesophagus, pancreas, lungs, kidneys, bladder or a wide range of other types of cancer. This is also new and important knowledge in the USA, where styrene was added to the list of carcinogenic substances in 2011," says Henrik A. Kolstad.

In relation to the types of cancer where the study shows a possible increased risk, i.e. nasal and paranasal cancer and myeloid leukaemia, Henrik A. Kolstad emphasises that more investigation needs to be done to determine if styrene is the actual cause of the employee's disease.

This must now be verified with detailed studies of the employees who

have become ill, for example by elucidating if they were directly involved in the production and the styrene levels they were exposed to.

Henrik A. Kolstad emphasises that the sins of the past are the focal point here, and that the working environment has changed significantly since then, so that work with styrene in the reinforced plastics industry in Denmark today takes place in closed spaces with strict exhaust ventilation requirements. As a researcher he also rejects the idea that people can 'just' use alternatives to styrene. This was a view that some of LM Wind Power's competitors promoted when the criticism of the company was at its highest:

"It is a case of risk assessment: Should you use styrene, which might have serious - though unconfirmed - side effects in the form of cancer, or should you use epoxy products, which has less serious but well-documented side effects in the form of eczema?" as Henrik A. Kolstad puts it. He expects the follow-up research results to be ready during the spring of 2017.

More information: Mette Skovgaard Christensen et al, Cancer Incidence in Workers Exposed to Styrene in the Danish-reinforced Plastics Industry, 1968–2012, *Epidemiology* (2017). DOI: 10.1097/EDE.0000000000000608

Provided by Aarhus University