

# Large users of zopiclone assessed as impaired

March 26 2009

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A new study from the Norwegian Institute of Public Health shows a positive link between the amount of the hypnotic (sleeping medicine) zopiclone in the blood and the chance of being assessed as impaired in a clinical examination. The study also included drivers who only showed alcohol in their blood test.

"This could be important background knowledge in the discussion about establishing legal limits in traffic for [sedatives](#) or sleep-inducing medicines as we have for [alcohol](#)," says Ingebjørg Gustavsen from the Division for Forensic Toxicology and Drug Research.

## Common sleeping medicines

Hypnotics that contain zopiclone and zolpidem (e.g. Imovane® and Stilnoct®) are widely used throughout the world and it is reported that between 3 and 7 % of the adult population uses these drugs. Researchers at the Norwegian Institute of [Public Health](#) have now studied if there is a link between the concentration of zopiclone or zolpidem in the [blood](#) and being assessed as impaired during a [clinical examination](#). The study was done on anonymised material by comparing blood samples and results from clinical tests for the period January 2000 to December 2007. The same study was performed on another group of [drivers](#) who only had alcohol in the blood.

## Link between substance concentration and impairment

The proportion of drivers who were evaluated as impaired increased with zopiclone-concentration in the blood. A similar positive link was not found for zolpidem. For alcohol, as expected, there was a significant link between the proportion of impaired drivers and alcohol concentration in the blood.

"We know that the clinical examination performed on suspicion of driving under the influence is a test that is most sensitive for alcohol impairment, and less sensitive for other substances. Other types of impairment are therefore not necessarily picked up with this study, which can explain why we have not found positive links for zolpidem. Another reason can be that there were few drivers in our sample, particularly in the groups with low concentrations," says Gustavsen.

The proportion of drivers who were evaluated as impaired was relatively similar for the group that had 130 µg/l zopiclone or more in the blood and the group that had a blood alcohol concentration higher than 0.1 %. A concentration of 130 µg/l zopiclone in the blood suggests intake of at least 2 large doses of zopiclone.

## **Abuse potential**

"Zopiclone and zolpidem are usually used in moderate amounts before bedtime, and will often be excreted from the body by the next morning. There are few users of these hypnotics that are stopped by police based on suspicion of driving under the influence. In the meantime we know that these substances also have abuse potential, as do other sedative or sleep-inducing medicines. Over 90 % of the drivers included in the study because of zopiclone- / zolpidem-use had higher concentrations of the substances in the blood than one would expect from normal therapeutic use of sleeping tablets before bedtime," concludes Gustavsen.

More information: Gustavsen, I., et al., Impairment related to blood drug

concentrations of zopiclone and zolpidem compared to alcohol in apprehended drivers. *Accid. Anal. Prev.* (2009), doi:10.1016/j.aap.2009.01.011

Source: Norwegian Institute of Public Health

Citation: Large users of zopiclone assessed as impaired (2009, March 26) retrieved 23 May 2024 from <https://medicalxpress.com/news/2009-03-large-users-zopiclone-impaired.html>

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