SWEDISH STUDY ON USE OF CELLULAR AND CORDLESS TELEPHONES AND THE RISK FOR BRAIN TUMOURS

Background: The analogue (NMT) cellular telephone system was introduced in Sweden in 1981 operating at 450 MHz and the 900 MHz system started in 1986 (closed in 2000). The digital (GSM) system started in 1991 and is now the most common mobile telephone type in Sweden. The first cordless telephones were available in Sweden in 1988. Microwave exposure from the use of cellular telephones has during recent years been discussed as a potential risk factor for brain tumours. Our first study indicated an increased risk for brain tumours in the most exposed area of the brain. We have now performed a larger study.

Methods: We included in a case-control study 1 617 patients aged 20-80 years of both sexes with brain tumour diagnosed during 1997 - June 30, 2000. They were alive at the study time and had histopathology verified brain tumour. One matched control to each case was selected from the Swedish Population Register. The study area was the Uppsala-Örebro, Stockholm, Linköping and Göteborg medical regions of Sweden. Exposure was assessed by a questionnaire that was answered by 1 429 (88%) cases and 1 470 (91%) controls.

Results: In total use of analogue cellular telephones gave an increased risk with odds ratio (OR)=1.26, 95% confidence interval (CI)=1.02-1.56. With a tumour induction period of >10 years this risk increased further to OR=1.77, CI=1.09-2.86. No clear association was found for digital or cordless telephones. Regarding anatomical area of the tumour and exposure to microwaves, the risk was increased for tumours located in the temporal area on the same side of the brain that was used during phone calls. For analogue cellular telephones OR=2.50, CI=1.28-4.88 was calculated. Use of a telephone on the opposite side of the brain was not associated with increased risk for brain tumours. Regarding different tumour types the highest risk was found for acoustic neurinoma with OR=3.27, CI=1.67-6.43 among analogue cellular telephone users, but an increased risk for also other tumour types could not be ruled out.

Conclusion: This study showed an increased risk for brain tumours among users of analogue cellular telephones. No clear association was found with use of digital cellular telephones or cordless telephones, but it is necessary with a longer observation time to rule out an increased risk for these telephone types.

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