I is the presence or absence of significant intrinsic sympathomimetic activity, and *S* is the presence or absence of significant cardioselectivity. Similarly, α is a constant, δ describes the overall treatment effect, β describes the effect of intrinsic sympathomimetic activity, and γ describes the effect of cardioselectivity.

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Risk factors for human hantavirus infection: Franco-Belgian collaborative case-control study during 1995-6 epidemic

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Puumala hantavirus is the most common human hantavirus infection in Europe.[1 2] It is transmitted to humans by inhalation or contamination of skin breaches by urine or faeces of infected bank voles. Infection ranges from subclinical to a severe influenza-like illness progressing to acute renal failure.[3] We carried out a case-control study in an endemic area in France and Belgium to estimate knowledge of hantavirus and identify possible risk factors for infection.

Subjects, methods, and results

National reference laboratories in each country identified cases for the study. A case was defined as someone with laboratory confirmed IgM positive *Puumala hantavirus* infection between 1 April 1996 and 31 July 1996 in the French departments Nord, Ardennes, and Aisne and Belgian provinces of Hainaut, Namur, and Luxembourg. Controls were matched by sex, community (village), and age group. They were randomly selected from the telephone book. Interviews were carried out by telephone using a standardised questionnaire covering knowledge of hantavirus, distance of the home to a forest, refuse disposal, rodent infestation and control, gardening activities, use of wood for heating or cooking, activities in forests, and entry into rodent infested buildings.

In all, 69/88 (78%) eligible cases were included in the study and 125 controls were recruited. Most cases were in men (51) and those aged 15-65 years (64). Two cases and one control were forestry workers—no others were in occupations thought to be at risk. Forty seven per cent (91/194) of those interviewed had heard of hantavirus infection before becoming ill or being interviewed. Friends were the commonest source of information (44/91, 48%); 63/75 (84%) had heard of the disease in the past 3 years.

The table shows the results of logistic regression. Cases and controls often went walking in forests (odds ratio 0.5, 95% confidence interval 0.1 to 2.7; P = 0.64). Cases were more likely to have entered a building where there might be rodents (1.9, 1.0 to 3.6; P = 0.05) and were more likely to have cleaned (4.2, 1.1 to 15.7;

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Conditional logistic regression model for infection with hantavirus. Adjusted odds ratios for activities undertaken by cases and controls

Exposure	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)	P value
Significant exposure in a forest (spent >16 hours in a forest; fetched, picked up, carried, or worked with wood; or exposed to dust or earth in a forest)	3.1 (1.6 to 6.0)	6.1 (1.9 to 19.5)	0.003
Interaction term between living <50 m from forest and seeing rodents	—	19.4 (1.2 to 308.2)	0.04
Lives <50 m from forest	3.5 (1.5 to 7.9)	1.9 (0.4 to 9.2)	0.43
Saw rodents at home	2.2 (1.1 to 4.3)	1.8 (0.5 to 6.1)	0.34
Entered a building where there may be rodents	2.7 (1.4 to 5.0)	3.0 (1.0 to 9.1)	0.046
Carries out rodent control at home	0.7 (0.3 to 1.4)	0.3 (0.1 to 1.1)	0.06
Home is cleaned more than once a week	2.9 (1.1 to 7.3)	3.8 (0.9 to 16.3)	0.07
Had been digging earth	3.6 (1.5 to 8.9)	3.1 (0.8 to 11.8)	0.09

P = 0.04 and raised dust there (15.7, 2.4 to 651; P = 0.01.) Two variables were constructed to refine the logistic regression analysis. For forests the variable was defined by those who spent more than 16 hours a month in forests, who went to forests for wood, or who picked up wood or were exposed to dust or earth during a leisure visit. For exposure in buildings where they may have been rodents the variable was defined by those who spent more than 2 hours there and who cleaned, raised dust, or made a vigorous physical effort. In the final model of the conditional logistic regression analysis, cases were more likely to live less than 50 metres from a forest and have seen rodents in or around their home, to have been digging, to have spent long periods in forests and been in contact with wood or disturbed earth or dust (table). Rodent control was more common among controls. Cases were more likely than controls to both live near a forest and see rodents at home (66.1, 5.7 to 768.9).

Comment

We did not test controls to ensure that they had never been infected subclinically, but in a previous case-control study in Belgium all 69 controls were seronegative[4] and the general population of the French Ardennes has a seroprevalence of only 0.45%.[5] The interaction between living near a forest and seeing rodents at home has not been previously reported—bank voles are thought to prefer empty buildings. Rodent control at home was protective. This simple, cheap measure can be recommended to those living near forest in an endemic area.

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Improvement in clinical work through feedback: intervention study

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We have frequently found an unacceptable number of hospital records and discharge reports lacking even the most basic information. To improve on this, we reviewed our hospital records and discharge reports on a regular basis, and we sent out questionnaires on quality of care to patients shortly after discharge. The hospital's medical staff received the results as a summarised report every other week. We deliberately disclosed only half of the variables studied. At the end of one year, the results were compared with those obtained before the intervention.

Subjects, methods, and results

Our study took place from September 1994 to October 1995 at the Department of Internal Medicine, University Hospital of Tromsø (120 beds and 45 doctors). We reviewed the hospital records for two sets of information: variables that were disclosed to the staff (past or present occupation, smoking habits, general physical condition, and blood pressure) and variables that were not disclosed (marital status, alcohol consumption, glandular enlargements, and