Acta Clin Croat 2007; 46:235-239 Professional Paper

DIFFERENCES IN THE KNOWLEDGE OF STROKE SYMPTOMS BETWEEN URBAN AND RURAL POPULATION

Anka Aleksić-Shihabi

Department of Neurology, General Hospital of Šibenik-Knin County, Šibenik, Croatia

SUMMARY – High mortality rates of stroke are due to insufficient knowledge of stroke among the population, which is the consequence of lifestyle and inadequate control of stroke risk factors. The knowledge of stroke symptoms was assessed in urban and rural population from the Šibenik-Knin County. A total of 448 subjects were studied, with equal numbers of urban and rural participants. In addition, the treatment of stroke and educational level of the subjects were recorded. The study was conducted as a survey comprising interviews and questionnaires with multiple right and wrong answers. The results showed that urban subjects had better knowledge of stroke symptoms than rural subjects, and both groups recognized speech disturbances as the most common stroke symptom (63.64% of urban and 50.44% of rural subjects; p=0.005), followed by weakness affecting one side of the body (61.82% of urban and 46.93% of rural subjects; p=0.002), and dysesthesias (pins and needles) affecting one side of the body (60.0% of urban and 44.74% of rural subjects; p=0.001). Both groups of subjects thought that stroke could be treated successfully. This could be due to differences in educational level because the group of rural population included more subjects with less than primary school or primary school education, and less subjects with high school and university education as compared with urban population, resulting in different lifestyle and better control of stroke risk factors in the latter.

Key words: *Cardiovascular accident – prevention; Health, education; Cardiovascular accident – Diagnosis; Cardiovascular accident – etiology; Knowledge attitudes practice; Health behavior; Demography; Croatia*

Introduction

Stroke is an important health and socioeconomic problem, both worldwide and in the Republic of Croatia, because it is one of the leading causes of mortality and disability.

In the European Union, stroke is the third leading cause of death, and in the countries of eastern and south-eastern Europe it is the leading cause of death[1,2]. The difference is due to insufficient knowledge of stroke among the population, the lifestyle and inadequate control of stroke risk factors. Stroke is one of the leading causes of long-term absenteeism and permanent disability, thus making a huge economic problem even in countries with a higher level of industrialization than Croatia. It has been estimated that 35,000 people suffer from stroke in Croatia *per* year[3-7].

Epidemiological data show that during the last decade of the 20th century, there was a decrease of stroke morbidity and mortality in western countries, which was the result of prevention. In spite of great advances in the diagnosis, treatment and neurorehabilitation of stroke patients, prevention remains the most important part of solving the problem of stroke.

The aim of the study was to determine differences in the knowledge of stroke symptoms among urban and rural population in the Šibenik-Knin County.

Subjects and Methods

The survey initially included 600 randomly chosen subjects with no history of stroke from the Šibenik-Knin County. The subjects were administered a questionnaire

Correspondence to: *Anka Aleksić-Shihabi, MD*, Department of Neurology, General Hospital of Šibenik-Knin County, HR-22000 Šibenik, Croatia

E-mail: analeksi@inet.hr

Received March 7, 2007, accepted in revised form September 2, 2007

containing three groups of questions: demographic data; items on the knowledge of stroke symptoms; and data on treatment. They were free to pose questions to clarify the possible indistinctness. The filled out questionnaires were analyzed (N=448), and those that were not filled out completely were discarded as invalid. To each of the questions multiple answers were offered, and subjects could tick more than one answer.

The study was conducted from July 2006 to December 31, 2006. The participants were divided according to the place of residence to urban and rural groups. The criteria for assigning the population as urban and rural were defined by the Republic of Croatia according to the population number or history of the settlement.

Demographic data on age, sex, place of residence and educational level were included. Questions on the knowledge of stroke symptoms had several right and several wrong answers. The right answers were: weakness affecting one side of the body, dysesthesias (pins and needles) affecting one side of the body, speech disturbances, sudden headache, and sudden visual disturbances. The wrong answers were: long-term dizziness, neck pain, low back pain, pain in the arms, and vomiting. Questions on the treatment of stroke addressed the subjects' attitudes toward treatment of stroke and contacting a physician.

For statistical data analysis, an ORACLE database (database 9i) was formed and data were analyzed by the ORACLE Forms builder 6 program. Results were shown as graphs in Windows XP Professional using Microsoft Excel. For statistical analysis, the STATISTICA version 6.0 (StatSoft, Inc. Tulsa, OK) software was used. Results were divided according to the place of residence, educational level and sex. Results were displayed as number (%). For between-group comparison, χ^2-test was used and data were presented as odds ratio (OR) with 95% confidence interval (CI). Statistical significance was set at the level of $p<0.05$.

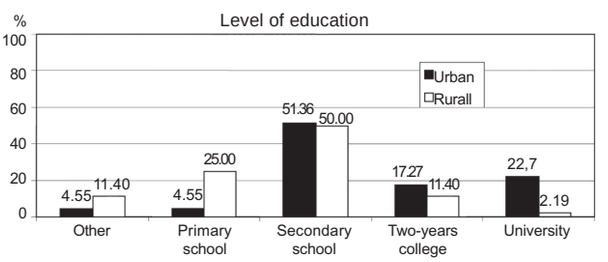
Results

Out of 600 randomly selected subjects, 448 subjects filled in the questionnaire completely. Demographic data are shown in Tables 1 and 2 and Figure 1. There was no significant difference in sex distribution ($\chi^2=0.133$; $p=0.715$), but there was a significant age difference between urban and rural subjects (mean age of urban and rural subjects was 47.9 and 54.3 years; $\chi^2=16.41$; $p<0.001$). According to educational level, the group of urban population included ten (4.6%) subjects with primary education, 113 (51.4%) with secondary education, 38 (17.3%) with high school education, 49 (22.3%) with university education, and ten (4.6%) others (with less than primary education or illiterate). In the group of rural population there were 57 (25.0%) subjects with primary education, 114 (50.0%) with secondary education, 26 (11.4%) with high school education, five (2.2%) with university education, and 26 (11.4%) others ($\chi^2=78.07$; $p<0.001$).

Table 1. Sex distribution according to place of residence (N=448)

	Men, n (%)	Women, n (%)	Total, N (%)
Urban	108 (49.1)	112 (50.9)	220 (100)
Rural	108 (47.4)	120 (52.6)	228 (100)
Total	216 (48.2)	232 (51.8)	448 (100)

Figure 1 shows the knowledge of stroke symptoms. Both urban and rural subjects ticked speech disturbances as the leading symptom of stroke (140 [63.6%] *vs.* 115 [50.4%]), followed by weakness affecting one side of the body (136 [61.8%] *vs.* 107 [46.9%]) and dysesthesias (pins and needles) affecting one side of the body (132 [60.0%] *vs.* 102 [44.7%]). Sudden headache ranked fourth (96 [43.6%] urban and 66 [29.0%] rural subjects), followed by long-term dizziness and sudden loss of sight. Considering the first four symptoms, urban subjects had a statistically significantly higher chance than rural subjects to know the right answer: speech disturbances, $\chi^2=7.95$; OR=1.72; 95% CI=1.18-2.51; $p=0.005$; weakness affecting one side of the body, $\chi^2=10.00$; OR=1.83; 95% CI=1.26-2.67; $p=0.002$; dysesthesias (pins and needles) affecting one side of the body, $\chi^2=10.45$; OR=1.85; 95% CI=1.27-2.70; $p=0.001$; and sudden headache, $\chi^2=10.46$; OR=1.90; 95% CI=1.28-2.81;



*p<0.001 calculated for difference in the level of education between urban and rural population ($\chi^2=78.07$)

Figure 1. Level of education according to place of residence (N=448)

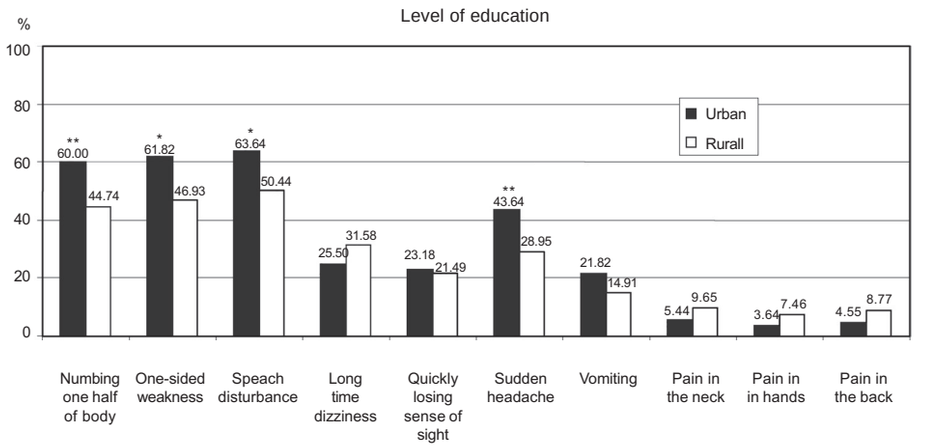


Figure 2. Knowledge about the symptoms of stroke according to place of residence (N=448)

*p=0.005, +p=0.002, **p=0.001, all calculated for difference in affirmative answers between urban and rural population.

p=0.001.

Considering the five right symptoms of stroke (weakness affecting one side of the body, dysesthesias affecting one side of the body, speech disturbances, sudden headache and sudden visual disturbances), a significantly greater proportion of urban subjects (126 [57.3%] ticked three or more of them as compared with 78 (34.1%) rural subjects (χ^2=24.01; p<0.001). Of urban subjects, 63 ticked three right answers (47 rural), 31 urban subjects ticked four right answers (24 rural), and 32 urban subjects and 7 rural subjects ticked five right answers (χ^2=18.18; p<0.001). Forty-five urban subjects and 46 rural subjects ticked none of the correct answers, 14 urban and 47 rural subjects ticked one correct answer, and 35 urban and 57 rural subjects ticked two correct answers. As many as 88.6% of urban subjects thought that stroke could be treated and 55.4% of them thought that treatment had good outcome; in the group of rural population, the respective figures were 81.3% and 69.3%.

Discussion

Results of the survey showed that urban subjects knew more about stroke symptoms compared with rural subjects, and both rated speech disturbances as the leading symptom of stroke, followed by weakness affecting one side of the body and dysesthesias (pins and needles) affecting one side of the body. The difference in the awareness of stroke symptoms could probably be explained by the difference in educational level between the urban and rural population because urban subjects had a higher level of education and knew more about stroke symptoms.

This is consistent with the study conducted by Vuletić *et al*. in Slavonski Brod, in which subjects stated speech disturbances, weakness affecting one side of the body, loss of balance, and dysesthesias affecting one side of the body as the leading stroke symptoms[8]. However, it is not in accordance with the study by Kothari *et al*., which indicated weakness affecting one side of the body as a stroke symptom most frequently stated by patients with acute stroke[9]. In the study conducted by Sug Yoon *et al*. in Newcastle in Australia in urban population, sight problems (24%) and "weakness and paralysis of one side of the body" were noted as the leading symptoms of stroke[10]. In the study carried out by the same authors in 1999 in Australia in urban population, speech disturbances (60%) and paresis of one side of the body (42%) were noted as the leading symp-

Table 2. Age distribution according to place of residence (N=448)

	Urban			Rural		
Age (yrs)	Men n (%)	Women n (%)	Total N	Men n (%)	Women n (%)	Total N
18-38	24 (10.9)	31 (14.1)	55	15 (6.6)	14 (6.1)	29
39-59	55 (25.0)	59 (26.8)	114	53 (23.3)	61 (26.8)	114
≥ 60	26 (11.8)	25 (11.4)	51	43 (18.9)	42 (18.4)	85

toms of stroke, which is consistent with our study[11]. In the study conducted by Panicoli *et al.*, dizziness was recognized as the leading symptom of stroke[12].

The present study was conducted using direct contact (interview) with the subjects. During the interview any vagueness could be clarified, similar to the study by Vuletic *et al.*, whereas the majority of other studies were conducted by telephone[10-18]. This could probably explain the similarities and differences in the results obtained.

Conclusion

The results of the study revealed better knowledge of stroke symptoms among urban population. This could be explained by difference in the educational level, because a higher percentage of rural subjects had less than primary education or primary education only, compared with the urban population, thus resulting in different lifestyle and better control of stroke risk factors in the latter. This study could be used for the development of educational programs to upgrade the awareness of stroke symptoms, thus improving stroke prevention as the most effective procedure.

References

1. BONITA R. Epidemiology of stroke. Lancet 1992;339:342-44.
2. WARLOW CP. Epidemiology of stroke. Lancet 1997;352(Suppl III):1-4.
3. DEMARIN V. Stroke – a medical challenge. Acta Clin Croat 1998;37(Suppl 2):7-9.
4. DEMARIN V, LOVRENČIĆ-HUZJAN A, TRKANJEC Z, VUKOVIĆ V, VARGEK-SOLTER V, ŠERIĆ V, LUŠIĆ I, KADOJIĆ D, BIELEN I, TUŠKAN-MOHAR LJ, ALEKSIĆ-SHIHABI A, DIKANOVIĆ M, HAT J, DeSYO D, LUPRET V. Recommendations for stroke management – 2006 update. Acta Clin Croat 2006;45:219-85.
5. LOVRENČIĆ-HUZJAN A, ZAVOREO I, RUNDEK T, DEMARIN V. The changing incidence of cerebrovascular disease in Zagreb over a ten-year period. Acta Clin Croat 2006; 45:9-14.
6. DEMARIN V. Stroke – diagnostic and therapeutic guidelines. Acta Clin Croat 2002;41(Suppl 3):9-10.
7. GREDELJ M, ed. Statistički ljetopis 2001. Zagreb: Državni zavod za statistiku, 2002.
8. VULETIĆ V, BOSNAR PURETIĆ M, LOVRENČIĆ HUZJAN A, DEMARIN V. Knowledge of stroke risk factors and warning signs among adults in Slavonski Brod region. Acta Clin Croat 2006;45:25-9.
9. KOTHARI R, SAUERBECK L, JAUCH E, BRODERICK J, BROTT T, KHOURY J, LIU T. Patients awareness of stroke signs, symptoms and risk factors. Stroke 1997;28:1871-5.
10. SUG YOON S, HELLER RF, LEVI C, WIGGERS J, FITZGERALD PE. Knowledge of stroke in urban population. Stroke 2001;32:1926-30.
11. SUG YOON S, HELLER RF, LEVI C, WIGGERS J. Knowledge and perception about stroke among an Australian urban population. BMC Public Health 2001;1:14.
12. PANICOLI AM, BRODERICK J, KOTHARI R, BROTT T, TUCHFARBERA A, MILLER R, KHOURY J, JAUCH E. Public perception of stroke warning signs and knowledge of potential risk factors. JAMA 1998;279:1288-92.
13. BLADES LL, OSER CS, DIETRICH DW, OKON NJ, RODRIGUEZ DV, BURNETT AM, RUSSELL JA, ALLEN MJ, FOGLE CC, HELGERSON SD, GOHDES D, HARWELL TS. Rural community knowledge of stroke warning signs and risk factors. Prev Chron Dis 2005;2:A14.
14. SILVER FL, RUBINI F, BLACK D, HODGSON CS. Advertising strategies to increase public knowledge of the warning signs of stroke. Stroke 2003;34:1965-8.
15. FAQUHAR JW, MacCOBY N, WOOD PD, ALEXANDER JK, BREITROSE H. Community education for cardiovascular health. Lancet 1997;1:1192-5.
16. CHEUNG RTF, LI LSW, MAK W, TSANG KL, LAUDER LJ, CHAN KH, FONG CY. Knowledge of stroke in Hong Kong Chinese. Cerebovasc Dis 1999;9:119-23.
17. SEGURA T, VEGA G, LOPEZ S, RUBIO F, CASTILLO J. Public perception of stroke in Spain. Cerebrovasc Dis 2003; 16:21-6.
18. REEVES MJ, HOGAN JG, RAFFERTY AP. Knowledge of stroke risk factors and warning signs among Michigan adults. Neurology 2002;59:1547-52.

Appendix: Questionnaire for randomly selected subjects

Year of birth……..... Sex: Male Female

Level of education: Primary school Secondary school

Two-year college University Other

Place of residence: City Village

Height……. Weight…….

1. Do you smoke?
   a) yes
   b) no
2. Do you have a stressful job?
   a) yes
   b) no
   c) intermediate

3. Do you have diabetes?
   a) yes, but I don't watch my diet
   b) yes, I am on a diet
   c) yes, I take pills or insulin
   d) no
   e) I don't know
4. Do you have high blood pressure?
   a) no
   b) yes, but I don't take any medicaments
   c) yes, I take medicaments regularly and my blood pressure is fine
   d) I occasionally have high blood pressure, I take medicaments as needed
   e) I don't know, I don't check my blood pressure
5. Do you have high lipids in blood?
   a) no
   b) yes, I am on a diet
   c) yes, I am on nothing
   d) yes, I take medicaments
   e) I don't know
6. Do you pursue physical activities?
   a) yes
   b) no
7. Do you drink alcohol?
   a) yes
   b) yes, occasionally
   c) yes, regularly
8. Do you have heart diseases?
   a) yes
   b) no
9. Which ones:
   a) arrhythmia
   b) angina pectoris
   c) cardiomyopathy
   d) you had a heart operation
10. Have you suffered a?
    a) heart attack
    b) stroke
11. Tick the symptoms of stroke:
    a) numbing one half of body
    b) weakness in arm or leg
    c) speech disturbance
    d) dizziness that lasts longer
    e) sudden loss of sight
    f) sudden headache
    g) vomiting
    h) pain in the neck
    i) pain in the hands
    j) pain in the back
12. Do you think that stroke can be treated?
    a) yes
    b) no
14. With what success?
    a) good
    b) poor

Sažetak

RAZLIKE U POZNAVANJU SIMPTOMA MOŽDANOG UDARA IZMEĐU GRADSKE I SEOSKE POPULACIJE

A. Aleksić-Shihabi

Visoke stope smrtnosti od moždanog udara uzrokovane su nedostatnim znanjem stanovništva o moždanom udaru koji nastaje kao posljedica načina života i nedovoljne kontrole rizičnih čimbenika za tu bolest. Poznavanje simptoma moždanog udara ispitivalo se među gradskim i seoskim stanovništvom u Županiji šibensko-kninskoj. Ispitivanje je obuhvatilo ukupno 448 osoba uz jednak udio ispitanika iz gradskih i seoskih sredina. Uz to je ispitano i liječenje moždanog udara, te razina obrazovanja ispitanika. Studija je provedena kao anketa s razgovorima i anketnim upitnicima koji su sadržavali višestruke ispravne i krive odgovore na pitanja. Rezultati su pokazali kako gradsko stanovništvo bolje poznaje simptome moždanog udara od osoba koje žive na selu, a obje su skupine prepoznale poremećaje govora kao najčešći simptom moždanog udara (63,64% gradskih i 50,44% seoskih ispitanika; p=0,005), nakon kojega slijedi slabost jedne strane tijela (61,82% gradskih i 46,93% seoskih ispitanika; p=0,002) i disestezije (trnci) u jednoj strani tijela (60,0% gradskih i 44,74% seoskih ispitanika; p=0,001). Obje skupine misle kako se moždani udar može uspješno liječiti. To bi moglo biti zbog razlike u razini obrazovanja, jer je u usporedbi sa skupinom gradskog stanovništva skupina ispitanika sa sela imala veći broj osoba s osnovnom školom ili manje od toga, a manje onih sa srednjim i visokim obrazovanjem, te slijedom toga različit način života i bolju kontrolu rizičnih čimbenika za moždani udar kod gradskog stanovništva.

Ključne riječi: *Kardiovaskularni inzult – prevencija; Zdravlje, obrazovanje; Kardiovaskularni inzult –dijagnostika; Kardiovaskularni inzult – etiologija; Znanje stavovi praksa; Ponašanje prema zdravlju; Demografija; Hrvatska*