Relationship between alcohol addiction and the incidence of cardiovascular disease in 9-year observation of Polish HAPIEE cohort.

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Background: Drinking three or more alcoholic beverages per day is associated with elevated cardiovascular disease (CVD) risk. Results from epidemiological studies suggest a lower risk of CVD occurring with moderate alcohol consumption compared with non-drinkers. However, even little amount of alcohol consumed regularly can cause addiction.

Purpose: To assess the relationship between the alcohol addiction and the incidence of CVD in Polish sample.

Methods: Cohort study with 9-year-follow-up was conducted. Random sample of 10,728 permanent residents of Krakow at age 45-69 completed baseline examination. Out of them 10,012 agreed for follow-up. Risk of alcohol addiction was assessed using CAGE questionnaire. Addiction was recognized when total score was 2 of 4. Information on new CVD cases was obtained from the second screening and three postal questionnaires, confirmed by clinical diagnosis. Information on deaths and causes was obtained from local registry, Central Statistical Office and by interviewing participants' families. Independent effect of the severity of alcohol problems on CVD risk was assessed using Cox proportional hazard models.

Table 1. Number of participants, person-years, new CVD cases and mean follow up time

Participants of baseline examination	10 728
Agreed for follow up	10 012
CAGE questionnaire available	8 537
Analytic sample: CAGE questionnaire available and free of CVD at baseline	7 112
Person-years analyzed	63866.3
New CVD cases	583
Follow-up time, x (SD)	8.98 (1.37)

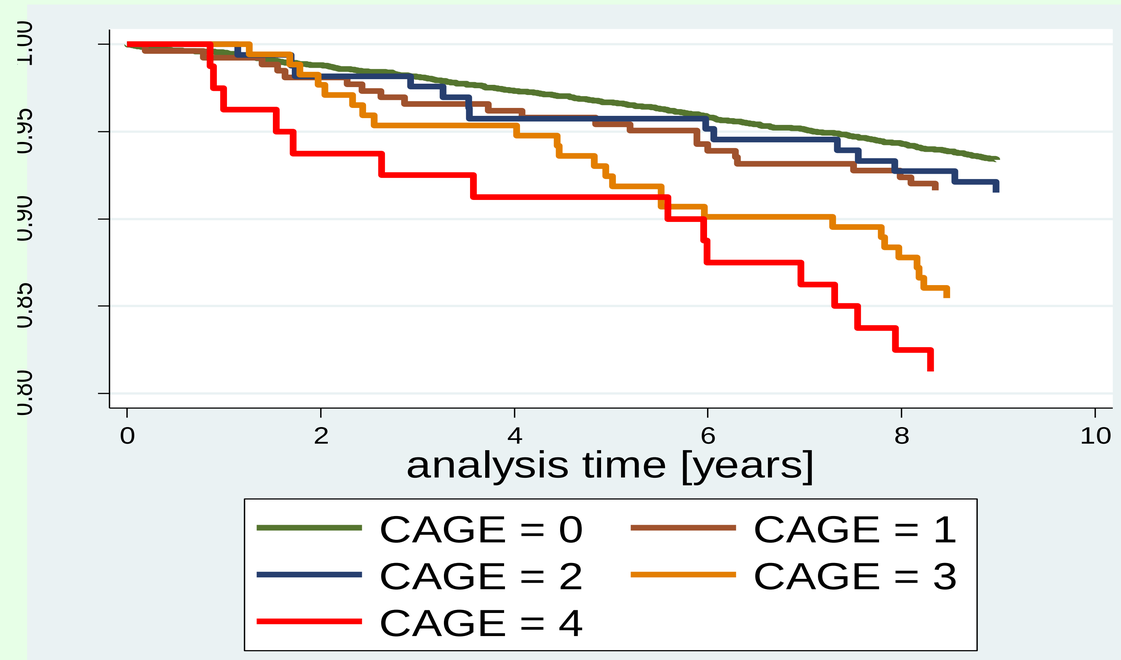

Fig. Kaplan-Meier survivor estimates by CAGE score

Table 2. Distribution of covariates by CAGE score

	CAGE SCORE					
	0	1	2	3	4	
N	6432	263	165	172	80	p
Men, n(%)	394 (52.77)	50 (19.01)	18 (10.91)	22 (12.79)	6 (7.50)	<0.001
Age [years], x(SD)	57.1 (6.91)	54.8 (6.28)	55.5 (6.58)	53.8 (5.84)	54.1 (5.32)	<0.001
Education, n(%)						
Voctional	1937 (30.13)	78 (29.66)	56 (33.94)	58 (33.72)	31 (38.75)	
high	2493 (38.78)	76 (28.90)	50 (30.30)	68 (39.53)	33 (41.25)	<0.001
university	1999 (31.09)	109 (41.44)	59 (35.76)	46 (26.74)	16 (20.00)	
Marital ststus, n(%)						
married/cohabiting	4999 (77.85)	222 (85.06)	128 (77.58)	139 (80.81)	65 (81.25)	0.066
single/widowed	1422 (22.15)	39 (14.94)	37 (22.42)	33 (19.19)	15 (18.75)	
Occupational status, n(%)						
working	3270 (50.90)	102 (38.78)	73 (44.24)	66 (38.73)	39 (48.75)	<0.001
not working	3154 (49.10)	161 (61.22)	92 (55.76)	106 (61.63)	41 (51.25)	
Perceived control score, x(SD)	37.2 (7.33)	35.7 (7.91)	35.7 (7.97)	34.2 (8.00)	32.5 (8.56)	0.027
Hypertension, n(%)	3601 (60.44)	138 (58.23)	101 (70.63)	99 (64.71)	47 (67.14)	0.063
Hypercholesterolemia, n(%)	4990 (85.93)	194 (83.98)	126 (87.50)	134 (90.54)	60 (86.96)	0.454
Diabetes, n(%)	764 (13.19)	36 (15.65)	18 (12.50)	24 (15.69)	12 (17.14)	0.58
BMI kg/m2], x(SD)	28.0 4.49)	27.8 (4.24)	27.5 (4.62)	27.1 (4.20)	26.4 (3.68)	0.113
Ever smoker, n(%)	3848 (59.97)	215 (81.75)	134 (81.21)	146 (85.88)	73 (91.25)	<0.001

Table 3. Association between CAGE score and risk of CVD event

CAGE score	HR[a] (95%CI)	HR[b] (95%CI)	HR[c] (95%CI)	HR[d] (95%CI)
0	1.00	1.00	1.00	1.00
1	1.25 (0.82-1.92)	1.01 (0.67-1.56)	0.89 (0.53-1.47)	0.87 (0.52-1.44)
2	1.49 (0.92-2.41)	1.15 (0.71-1.87)	0.98 (0.56-1.72)	0.94 (0.54-1.64)
3	2.80 (1.91-4.10)	2.17 (1.47-3.20)	2.07 (1.36-3.17)	1.92 (1.24-2.95)
4	3.36 (2.00-5.62)	2.49 (1.48-4.18)	2.49 (1.44-4.28)	2.28 (1.32-3.94)

a - adjusted for age

b - adjusted for age, sex, education, marital status, ocupational status

c - adjusted for age, sex, education, marital status, ocupational status, hypertension, hypercholesterolemia, smoking, diabetes, BMI

d - adjusted for age, sex, education, marital status, ocupational status, hypertension, hypercholesterolemia, smoking, diabetes, BMI and perceived control

Results: The analysis included 7,112 persons having data on CAGE and free of CVD at baseline. No alcohol problems (0 points) were found in 90% of participants. Almost 4% had 1 point. 2.5% of participants scored 2 and 3 points. 80 persons (1%) answered positively for 4 questions. Median follow-up time was 9.07 years (IQR=0.9). Total of 63,866 person-years were analyzed. During the follow-up 583 incident CVD cases occurred. After adjustment for age, compared to persons with no alcohol problems participants with 3 or 4 points had higher risk of CVD by about 3 times (HR=2.80 95%CI=1.91-4.10 and HR=3.36 95%CI=2.00-5.62, respectively). Further adjustment for sex, education, marital status and occupational status reduced the estimates to: HR=2.17 95%CI=1.47-3.20 and HR=2.49 95%CI=1.48-4.18, respectively. Additional adjustment for hypertension, hypercholesterolemia, smoking, BMI, diabetes did not influence the estimates. Further adjustment for perceived control reduced the HRs by about 10%, leaving persons with 3 or 4 point on CAGE scale at twice higher risk of CVD incident compared to persons with no alcohol problems (HR=1.92 95%CI=1.24-2.95 and HR=2.28 95%CI=1.32-3.94, respectively). Association between alcohol problems assessed as 1 or 2 points on CAGE scale and CVD incidence was much weaker and explained by the covariates.

Conclusion: Strong alcohol addiction was predictor of incident CVD, independent of main CVD risk factors.

Conflict of interest: NONE