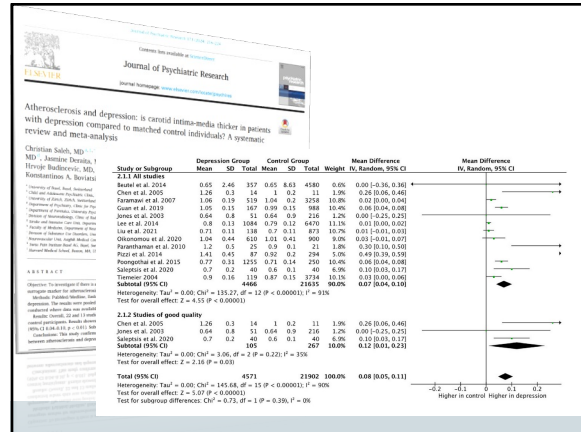


Carotid Intervention Improves Mood In Depressed Patients With Carotid Stenosis: What Is The Evidence And Should All Depressed Patients With Carotid Disease Undergo Carotid Intervention

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RESEARCH ARTICLE

Patients with carotid atherosclerosis who underwent or did not undergo carotid endarterectomy: outcome on mood, cognition and quality of life

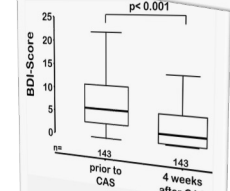
Abstract
 To compare the six-month outcome on mood, cognition and quality of life (QoL) in patients with severe carotid atherosclerosis (CAS) who underwent carotid endarterectomy (CEA) with subjects who did not.

Methods
 Cohort study of consecutive operations with CAS (n=25) (N=46, age 72.6, 23.6, male 42). Inclusion criteria: subjects who decided to undergo CEA (n=25). Control group: subjects with severe CAS (n=21). DSM-IV-TR diagnosis made by clinicians using interviews. QoL measured by Short Form Health Survey (SF-36), cognitive performance by Mini-Mental State Examination (MMSE).

Results
 The study showed a better improvement during six months in mood (General Health and Total QoL) in the group that underwent CEA. In the last six months, did not reach statistical significance. However, at the levels of statistical significance in performance in CEA. The difference of subjects with improvement of QoL outcome in General QoL score. Limit: study conducted with a small sample size.

Conclusions
 Patients with severe carotid atherosclerosis who underwent CEA enhanced their cognitive performance.

Keywords
 Carotid atherosclerosis, Carotid endarterectomy, Depression, dementia, Cognitive impairment, Quality of life.



Drug-Resistant Major Depression Associated With Carotid Artery Stenosis

Florence Gressler, M.D., Hedi Khif, M.D., Christian Denier, M.D., Ph.D., Patrick Hardy, M.D., Ph.D., Denis Ducreux, M.D., Ph.D., and Emmanuelle Corraube, M.D., Ph.D. **AUTHORS INFO & AFFILIATIONS**

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TO THE EDITOR: We report a case of drug-resistant major depression due to left carotid artery stenosis, with rapid and full recovery following carotid endarterectomy.

Carotid Intervention on Cognitive Function

Measure	n	Preop vs. 1 month postop		P-value	Cohen's d
		Preop Mean ± SD (CI)	Postop Mean ± SD (CI)		
WAISE III-Digit Span	133	10.38 ± 2.76 (9.9-10.85)	10.65 ± 2.72 (10.18-11.11)	0.077	0.154
WAISE III-Letter/Number	104	8.45 ± 3.447 (7.8-9.12)	9.09 ± 3.066 (8.49-9.68)	0.016	0.240
TMT - A	132	7.74 ± 3.097 (7.1-8.27)	8.41 ± 3.207 (8.6-8.96)	<0.001	0.313
TMT - B	126	7.92 ± 3.067 (7.38-8.65)	8.54 ± 3.048 (8.08-9.08)	0.003	0.273
BNT	120	10.78 ± 2.75 (10.28-11.27)	10.28 ± 2.866 (9.71-10.80)	0.001	0.312
GDS	127	7.51 ± 6.12 (6.44-8.59)	6.72 ± 6.13 (5.65-7.80)	0.015	0.220

Measure	n	Preop vs. 6 months postop		P-value	Cohen's d
		Preop Mean ± SD (CI)	Postop Mean ± SD (CI)		
Digit Span	99	10.54 ± 3.029 (9.9-11.14)	11.12 ± 2.81 (10.56-11.68)	0.011	0.261
Letter/Number	83	8.92 ± 3.298 (8.2-9.64)	9.59 ± 3.008 (8.4-10.25)	0.028	0.245
TMT - A	98	8.07 ± 3.337 (7.4-8.74)	8.94 ± 3.408 (7.6-10.2)	0.001	0.341
TMT - B	97	8.12 ± 3.107 (7.5-8.75)	8.86 ± 2.908 (7.7-10.0)	0.005	0.291
BNT	92	10.22 ± 3.140 (9.5-10.87)	10.95 ± 3.06 (10.31-11.58)	<0.001	0.410
GDS	97	7.22 ± 6.208 (5.7-8.97)	7.24 ± 6.410 (5.94-8.53)	0.856	0.046

Measure	n	Preop vs. 12 months postop		P-value	Cohen's d
		Preop Mean ± SD (CI)	Postop Mean ± SD (CI)		
Digit Span	87	10.37 ± 2.768 (9.78-10.96)	11.05 ± 2.90 (10.43-11.67)	0.002	0.345
Letter/Number	83	8.52 ± 3.477 (7.65-9.40)	9.37 ± 3.66 (8.44-10.29)	0.043	0.260
TMT - A	81	7.79 ± 3.027 (7.12-8.46)	9.07 ± 3.448 (8.30-9.85)	<0.001	0.576
TMT - B	80	7.93 ± 3.067 (7.18-8.51)	8.85 ± 3.377 (8.2-9.42)	0.016	0.375
BNT	78	10.45 ± 2.979 (9.78-11.12)	11.25 ± 2.66 (10.66-11.86)	<0.001	0.436
GDS	82	7.73 ± 6.81 (6.45-9.01)	6.84 ± 6.14 (4.89-8.79)	0.087	0.194

Geriatric Depression Scale (Long Form)

Instructions: Choose the best answer for how you felt over the past week.

No.	Question	Answer	Score
1.	Are you usually satisfied with your life?	YES/NO	1/0
2.	Have you enjoyed many of your activities and interests?	YES/NO	1/0
3.	Do you feel that you're lonely?	YES/NO	0/1
4.	Do you get your own things?	YES/NO	1/0
5.	Are you happy about the future?	YES/NO	1/0
6.	Are you bothered by thoughts you can't get out of your head?	YES/NO	0/1
7.	Are you a good person most of the time?	YES/NO	1/0
8.	Are you afraid that something bad is going to happen to you?	YES/NO	0/1
9.	Do you feel that you're nervous?	YES/NO	0/1
10.	Do you often get restless or fidgety?	YES/NO	0/1
11.	Do you often feel alone, even when you're not?	YES/NO	0/1
12.	Do you think it's wonderful to be alive now?	YES/NO	1/0
13.	Do you think you have more problems with memory than most?	YES/NO	0/1
14.	Do you think it's a bother to get up in the morning?	YES/NO	0/1
15.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
16.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
17.	Do you feel that you're getting on about the same?	YES/NO	0/1
18.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
19.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
20.	Do you feel that you're getting on about the same?	YES/NO	0/1
21.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
22.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
23.	Do you feel that you're getting on about the same?	YES/NO	0/1
24.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
25.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
26.	Do you feel that you're getting on about the same?	YES/NO	0/1
27.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
28.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
29.	Do you feel that you're getting on about the same?	YES/NO	0/1
30.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
31.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
32.	Do you feel that you're getting on about the same?	YES/NO	0/1
33.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
34.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
35.	Do you feel that you're getting on about the same?	YES/NO	0/1
36.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
37.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
38.	Do you feel that you're getting on about the same?	YES/NO	0/1
39.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
40.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
41.	Do you feel that you're getting on about the same?	YES/NO	0/1
42.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
43.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
44.	Do you feel that you're getting on about the same?	YES/NO	0/1
45.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
46.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
47.	Do you feel that you're getting on about the same?	YES/NO	0/1
48.	Do you feel that you're getting on better than you used to?	YES/NO	1/0
49.	Do you feel that you're getting on worse than you used to?	YES/NO	0/1
50.	Do you feel that you're getting on about the same?	YES/NO	0/1

Cutoff normal to mild depression: 10-19; severe depression: 20-30.

Characteristics n (%)	Overall Cohort N=157	Depressed (GDS>9)	Not-Depressed (GDS≤9)	P-value
		N=49 (31.21%)	N=108 (68.79%)	
Age, years, mean ± SD	69.63 ± 7.59	68.51 ± 6.97	70.14 ± 7.83	0.214
CAS (vs CEA)	78(48.72%)	29(60.42%)	47(43.52%)	0.051
Prior stroke	29(18.47%)	12(24.49%)	17(15.74%)	0.190
Diabetes	62(39.49%)	17(34.69%)	45(41.67%)	0.407
Smoking	122(77.70%)	41(83.67%)	81(75%)	0.226
Alcohol	79(50.32%)	28(57.14%)	51(47.22%)	0.249
Hypertension	138(86.62%)	48(98.38%)	90(83.33%)	0.072
Hyperlipidemia	134(85.35%)	41(83.67%)	93(86.11%)	0.689
Obesity	55(35.03%)	20(40.82%)	35(32.41%)	0.306
Coronary Artery Disease	68(43.31%)	24(48.98%)	44(40.74%)	0.334
Congestive Heart Failure	17(10.83%)	9(18.37%)	8(7.41%)	0.041
LDLP	20(12.74%)	8(16.37%)	11(10.19%)	0.154
Peripheral Vascular Disease	38(24.20%)	13(26.53%)	25(23.15%)	0.646
Atrial Fibrillation	17(10.89%)	7(14.29%)	10(9.35%)	0.358
Chronic Renal Failure	30(19.11%)	12(24.49%)	18(16.67%)	0.248
Medications				
Antiplatelets	107(68.15%)	31(63.27%)	76(70.37%)	0.376
Anticoagulants	29(18.47%)	10(20.41%)	19(17.59%)	0.673
Statins	139(88.53%)	41(83.67%)	98(90.74%)	0.197
Symptomatic	80(50.95%)	30(61.22%)	50(46.30%)	0.083

Preoperative cognitive performance in both groups

Cognitive measures	Overall cohort (N=157)		
	Depressed (GDS>9) N=49 (31%)	Non-depressed (GDS ≤ 9) N=108 (69%)	P
RAVLT immediate recall	-0.96 ± 1.1	-0.65 ± 0.96	0.083
RAVLT sum	-0.98 ± 1.32 (-1.36; -0.60)	-0.53 ± 1.80 (-0.75; -0.30)	0.041
TMT-A	6.80 ± 3.14 (5.87; 7.73)	8.39 ± 2.90 (7.83; 8.95)	0.004
TMT-B	6.88 ± 3.26 (5.88; 7.88)	8.53 ± 2.85 (7.98; 9.08)	0.005
Digit Span	10.40 ± 3.19 (9.5; 11.34)	10.63 ± 2.66 (10.12; 11.14)	0.641
Digit Symbol	7.15 ± 2.63 (6.37; 7.93)	8.89 ± 2.38 (8.43; 9.36)	<0.001
BNT	9.77 ± 2.89(8.89; 10.65)	10.22 ± 3.11 (9.61; 10.84)	0.410

Intervention-related change in GDS

Depressed (GDS>9) N=49				Non-depressed (GDS ≤ 9) N=108			
N	Preop Mean ± SD(CI)	Postop Mean ± SD(CI)	P	N	Preop Mean ± SD(CI)	Postop Mean ± SD(CI)	P
Preop vs. 1 month postop							
35	15.6 ± 4.7 (14-17)	13.6 ± 4 (10-15)	0.002	92	4.4 ± 2.9(3.8-5)	4.3 ± 3.9(3.5-5)	0.73
Preop vs. 6 months postop							
28	15.4 ± 4.6 (13.7-17.2)	13.2 ± 6.7 (10.6-15.8)	0.017*	69	4.1 ± 2.9(3.4-4.8)	4.8 ± 4.4(3.7-5.8)	0.12
Preop vs. 12 months postop							
25	15 ± 3.8 (13.4-16.6)	11.6 ± 4.9 (9.6-13.6)	<0.001*	57	4.5 ± 2.9(3.7-5.3)	4.7 ± 5.4(3.3-6.2)	0.72

Intervention-related Change in Cognitive Function

Time points	Cognitive measures	Depressed (GDS>9) (N=49)				Non-depressed (GDS ≤ 9) (N=108)			
		n	Mean difference	95% CI	P	n	Mean difference	95% CI	P
1 month Postop vs. Preop	Digit Span	35	0.54 ± 0.33	(0.12; 1.21)	0.11	89	0.19 ± 0.18	(-0.17; 0.55)	0.36
	Digit Symbol	34	0.26 ± 0.21	(-0.15; 0.68)	0.21	89	0.52 ± 0.15	(0.22; 0.82)	<0.001
	RAVLT immediate recall	35	0.09 ± 0.15	(-0.22; 0.40)	0.56	78	0.04 ± 0.09	(-0.14; 0.22)	0.67
	RAVLT sum	38	0.19 ± 0.14	(-0.08; 0.48)	0.17	86	0.26 ± 0.10	(0.05; 0.48)	0.014
	TMT-A	35	0.74 ± 0.33	(0.05; 1.43)	0.04	91	0.89 ± 0.23	(0.22; 1.15)	0.004
6 months Postop vs. Preop	TMT-B	32	0.56 ± 0.33	(-0.11; 1.24)	0.10	88	0.68 ± 0.26	(0.15; 1.20)	0.010
	BNT	31	0.84 ± 0.31	(0.01; 1.27)	0.05	93	0.48 ± 0.16	(0.15; 0.81)	0.006
	Digit Span	29	1.13 ± 0.36	(0.38; 1.87)	<0.001*	64	0.31 ± 0.29	(-0.28; 0.81)	0.30
	Digit Symbol	27	0.07 ± 0.25	(-0.45; 0.39)	0.71*	85	0.62 ± 0.22	(0.17; 1.06)	0.007
	RAVLT immediate recall	28	0.48 ± 0.14	(0.20; 0.77)	0.000*	86	0.25 ± 0.10	(0.05; 0.44)	0.004
12 months Postop vs. Preop	RAVLT sum	27	0.34 ± 0.22	(-0.11; 0.79)	0.17*	85	0.22 ± 0.13	(-0.03; 0.48)	0.091
	TMT-A	28	0.39 ± 0.36	(-0.35; 1.13)	0.3*	86	1.10 ± 0.34	(0.42; 1.79)	0.002
	TMT-B	27	0.55 ± 0.40	(-0.26; 1.36)	0.3*	86	0.86 ± 0.33	(0.13; 1.47)	0.003
	BNT	26	0.65 ± 0.41	(-0.18; 1.48)	0.12*	81	0.85 ± 0.21	(0.42; 1.28)	<0.001
	Digit Span	24	1.21 ± 0.30	(0.40; 2.01)	0.003*	57	0.51 ± 0.26	(-0.02; 1.03)	0.059
12 months Postop vs. Preop	Digit Symbol	23	0.65 ± 0.28	(0.06; 1.24)	0.04*	54	0.81 ± 0.23	(0.14; 1.07)	0.011
	RAVLT immediate recall	24	0.26 ± 0.21	(-0.17; 0.69)	0.3*	63	0.12 ± 0.13	(-0.14; 0.38)	0.343
	RAVLT sum	25	0.21 ± 0.19	(-0.19; 0.61)	0.44	52	0.03 ± 0.19	(-0.35; 0.16)	0.86
	TMT-A	23	1.21 ± 0.47	(0.22; 2.21)	0.014*	55	1.29 ± 0.30	(0.68; 1.88)	<0.001
	TMT-B	22	1.13 ± 0.49	(0.11; 2.16)	0.031*	55	0.82 ± 0.39	(-0.17; 1.41)	0.12
BNT	21	0.95 ± 0.59	(-0.13; 1.77)	0.022*	51	0.88 ± 0.27	(0.34; 1.42)	0.002	

- Summary**
- High prevalence of depression among patients with severe carotid disease
 - Favorable post-intervention changes in mood in those who screened positive on the GDS-30 questionnaire before the intervention
 - Nondepressed patients had significant and consistent improvement in cognitive function following the intervention, while depressed patients only experienced a late improvement