Open Access Library Journal
2023, Volume 10, e10865
ISSN Online: 2333-9721
ISSN Print: 2333-9705

Pattern of Risk Factors of Cardioembolic Stroke in Dhamar Governorate Yemen

Hadi Mujlli, Mohammed Ali Al Huthi, Daifallah Jaid, Ebraheem Huseen Al Haj, Ehsas Khaled Ahmed, Hamza Al-Barakani

Thamar Medical College, Thamar University, Dhamar, Yemen
Email: dr.hadimujlli@gmail.com

How to cite this paper: Mujlli, H., Huthi, M.A.A., Jaid, D., Haj, E.H.A., Ahmed, E.K. and Al-Barakani, H. (2023) Pattern of Risk Factors of Cardioembolic Stroke in Dhamar Governorate Yemen. *Open Access Library Journal*, **10**: e10865.
https://doi.org/10.4236/oalib.1110865

Received: October 9, 2023
Accepted: November 25, 2023
Published: November 28, 2023

Abstract

Stroke is a leading cause of mortality and disability in Yemen and around the world. Cardio-embolism is responsible for nearly 30% of the origins of ischemic stroke. **Objective:** The purpose of this study was to determine the incidence cardio-embolic subtype. **Material and Methods:** The current study was done on 77 hospitalized patients who admitted as case of cardio-embolic ischemic stroke in Thamar governorate, Yemen. Cross-sectional study been conducted in Al_Wahada Teaching 2021 and available cases in internal /hospital and Dhamar hospital in academic year 2021medicine department in A Lwahada hospital, Dhamar hospital and Arryadah Hospital during period of study. **Results:** Of the 77 patients, 44 (57.10%) were male patients, and 33 (43.90%) were female, hypertension were the most common cause of cardio-embolism corresponding to (54.50%) followed by acute coronary syndrome (11.7%) and cardiomyopathy (7.8%), arrhythmia (3.9%) and infective endocarditis (1.3%) were the most common risk factors. **Conclusion:** The risk of stroke increases with age. In this study, Hypertension, Smoking, Shamma, were the main causes of cardio-embolism.

Subject Areas

Cardiology

Keywords

Stroke, Cardio-Embolism, Acute Cerebral Ischemia, Smoking, Shamma

1. Introduction

Stroke is defined by WHO as rapidly developing clinical signs of focal/ global-disturbance of cerebral function, lasting more than 24 hours or leading to death,

with no apparent cause other than of vascular origin [1]. It is typically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system by a vascular cause, including cerebral infarction, intra-cerebral hemorrhage, and subarachnoid hemorrhage (SAH). Stroke is becoming common disease worldwide, and has an increased rate of recurrence yearly after a transient ischemic attack (TIA) or stroke [2]. Stoke is classified on basis of its cause as Hemorrhagic Stroke (13%), ischemic Stroke, (87%) [3] [4]. The Ischemic stroke is produced by occlusion of a cerebral artery Cryptogenic (31%), cardio-embolic (29%), Lacunar (21%), Large Vessel Atherosclerotic (15%) and Other (5%) [5]. cardioembolic stroke has significance for 2 reasons. First, cardiac embolism causes more severe strokes than other ischemic stroke subtypes [6]. Cardio-embolic Stroke is caused primarily by cardiac diseases that predisposes the patient to form a thrombus within the heart wall or left heart valves which may then detach and embolism into the arterial circulation and lodge within a cerebral artery and occlude blood flow and the most commonly caused by atrial fibrillation.

Cardiac embolism accounts for an increasing proportion of ischemic strokes, and might multiply several-fold over the next decades [2] [7]. Cardioembolism is responsible for nearly 30% of the origins of ischemic stroke, cardiac embolism causes more severe strokes than other ischemic stroke subtypes [8] [9] [10] Currently, new therapies are being introduced and these are specific to certain cardio-embolic diseases. Nowadays, new oral anticoagulants (NOAC) have been used to better control nonvalvular atrial fibrillation [11].

Treatment options are limited to thrombolysis, but only few patients receive this treatment owing to restrictions in application time and indication [12].

2. Clinical Methods

The current study was done on 77 hospitalized patients who admitted as case of cerebrovascular disease in Al-Wahda teaching hospital and other hospitals in Thamar governorate, Yemen. The presence of a typical clinical presentation and neuroimaging profile, positive evidence of a high-risk cardiac source, and the exclusion of a large artery plaque suffice to establish a diagnosis of cardioembolic stroke. The data will be collected over a period of six months, which will include the information obtained by study procedures. The data will be analyzed by SPSS (version 2020) using percentage, mean and SD, P value correlation.

3. Results

The current study was done on 77 hospitalized patients who admitted as case of cerebrovascular disease. As shown in **Table 1**, 44 (57.1%) were male patients, and 33 (42.9%) were female. As for age, 38 (49.4%) of all patients were the ages of more than 75 years old, which was the major group, 33 (42.9%) were between 45 - 74 years old, whereas 6 (7.8%) were between 15 - 44 years old. The results indicated that 45 (58.4%) of all patients chewed khat, which was the largest

Table 1. Socio-demographic character Response, DM and special habits (n = 77).

Characteristics		Frequency (n)	Percentage (%)
Age	15- 44	6	7.80%
	45 - 74	33	42.90%
	>75	38	49.40%
Gender	male	44	57.10%
	Female	33	42.90%
Residence	Urban	25	32.50%
	Rular	52	67.50%
Area	Anis	26	33.80%
	Dhamar	15	19.50%
	Al hada	12	15.60%
	Anns	9	11.70%
	Mabaar	7	9.10%
	Radaa	5	6.50%
	Others	3	3.90%
Special Habits			
Smoking	Yes	35	45.50%
	No	42	54.50%
Duration of smoking	less than 10 years	6	17.10%
	More than 10 years	29	82.90%
Khat chewing	Yes	45	58.40%
	No	32	41.60%
Duration of Khat chew	less than 10 years	7	15.60%
	More than 10 years	38	84.40%
shamma use	Yes	11	14.30%
	No	66	85.70%
Duration of Shamma	less than 10 years	3	27.30%
	More than 10 years	8	72.70%
Diabetes Mellitus (DM)			
Have DM or not	Yes	30	39%
	No	47	61%
Duration of DM	Recent	4	13.30%
	<5 years	6	20%
	5 - 10 years	14	46.70%
	>10 years	6	20%

percentage, followed by 35 (45.5%) as smokers and 11 (14.3%) as shamma users (Figure 1). For patients with diabetes mellitus, 30 (39%) of all cases, more duration between 5 - 10 years 14 (46.7%), 20 (66.7%) was under control. Table 2 and Table 3 shows the results about drug use, family history and the investigation.

4. Discussion

Stroke and ischemic heart disease are among the leading causes of death and disability worldwide. Even more worrisome is that in the recent year's stroke rates are gradually increasing in certain developing nations. There is a suggested escalation in the prevalence and incidence of stroke in India over the last 3 decades. While the frequency of the specific causes of ischemic stroke may differ around the world, [12] [13] the purpose of this review is to explore the subtype of stroke known as the cardioembolic stroke. A cardioembolic stroke is when the heart pumps unwanted materials into the brain circulation that results in the occlusion of a brain blood vessel and subsequent damage to the brain tissue. [2] The current study was done on 77 hospitalized patients who admitted as case of cerebrovascular disease in Al-Wahda teaching hospital and other hospitals in Thamar governorate, Yemen. It was observed that male patients 44 (57.1%) were more than female patients 33 (42.9%) as shown in Table 1. These results were agreeing with some previous studies, which revealed that men are at a 15% higher risk of having a stroke and at a younger age compared to women, nevertheless, women have strokes at a later age, which makes them less likely to recover and more likely to die as a result. Where others found no significant difference between them. [14] Strokes occur in all age groups. In the present study 6 (7.8%) of all patients were between 15 - 44 years old, 33 (42.9%) were between 45 - 74 years old, whereas 38 (49.4%) were more than 75 years old, which indicates that risk of stroke increased significantly above 75 years old, according to residence 52 (67.5%) in rural and 25 (32.5%) in urban, as shown in Table 1. In the current study, we found that cardiovascular diseases from all cases 42 (54.50%) with hypertension, 3 (3.9%) had arrhythmia, 6 (7.8%) with cardiomyopathy, 9 (11.7%) with acute coronary syndrome, 1 (1.3%) with infective endocarditis. Possibly, the number of strokes caused by atrial fibrillation is larger than that described in this research, due to paroxysmal atrial fibrillation cases that may not have been diagnosed, as shown in Table 2. For patients with diabetes mellitus, 30 (39%) of all cases, more duration between 5 - 10 years 14 (46.7%), 20 (66.7%) was under control as shown in Table 1.

On current study we find that, 23 (29.9%) with past history of ischemic stroke, and 18 (23.4%) with past history of heart disease, major 11 (61.1%) was IHD. Patients with past history of drug intake 27 (35.1%) of all cases, as most of them 18 (63%) use Aspirin. Family history was 11 (14.3%) with CVA of all cases, and heart disease 4 (5.2%) as shown in Table 2. Vital sign during admission pulse rate 69 (89.6%) normal, blood pressure 41 (53.2%) high, others normal. The investigations HB, brain CT and ECG 77 (100%) done, 65 (84.4%) done RBS, 11 (14.3%) only do lipid profile, 12 (15.6%) only done Echo and 77 (100%) not

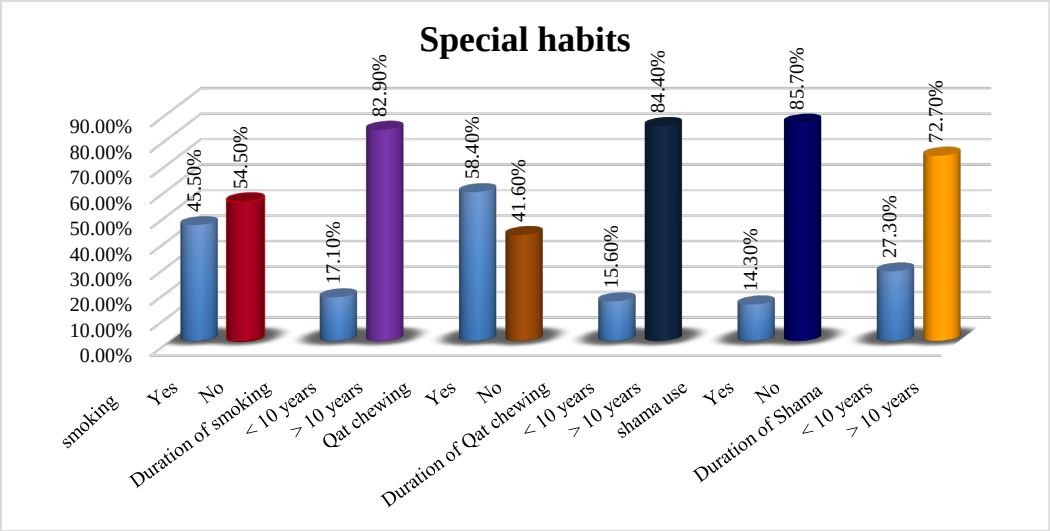

Figure 1. Special habits.

Table 2. Drug & family history.

Characteristics	Frequency (n)	Percent (%)
Drug use		
Yes	27	35.1
No	50	64.9
Type of drug		
Anti-DM	3	9.25%
Anti-HTN	8	27.75%
Aspirin	17	63%
Family history of CVA		
Yes	11	14.30%
No	66	85.70%
Family History of HD		
Yes	4	5.20%
No	73	94.80%
Type of Heart Disease		
HTV	2	50%
MI	1	25%
VHD	1	25%

Table 3. The investigation.

Characteristics		Frequency (n)	Percent (%)
HB	Done	77	100%
	Not done	0	0%
RBS	Done	65	84.40%
	Not done	12	15.60%

Continued

Lipid profile	Done	11	14.30%
	Not done	66	85.70%
CT	Done	77	100%
	Not done	0	0.00%
MRI	Done	0	0.00%
	Not done	77	100.00%
ECHO	Done	12	15.60%
	Not done	65	84.40%
ECG	Done	77	100.00%
	Not done	0	0.00%

done MRI as shown in Table 3. Cardioembolic Stroke is caused primarily by cardiac diseases that predisposes the patient to form a thrombus within the heart wall or left heart valves which may then detach and embolize into the arterial circulation and lodge within a cerebral artery and occlude blood flow and the most commonly caused by atrial fibrillation. Currently, new therapies are being introduced and these are specific to certain cardioembolic diseases. Now a days, new oral anticoagulants drugs have been used to better control nonvalvular atrial fibrillation.

5. Conclusions

From the results obtained in this study, it can be inferred that:

- The risk of stroke increases with age.
- Stroke is more desirable to occur with person who has bad habits as smoking, chewing khat and chewing tobacco (shammah).
- Hypertension is one of the most important risk factors causing stroke.
- More cases from rural, may as socioeconomic or other cause.
- Difficulty with COVID-19 cases.

6. Recommendations

Primary prevention:

- Avoid shammah.
- Avoid smoking and Khat chewing.
- Control for diabetes and hypertension.
- Use Anti- hyperlipidemia drug.

Secondary prevention:

- Aspirin alone for life not enough.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Krishnamurthi, R.V., Feigin, V.L., Forouzanfar, M.H., Mensah, G.A., Connor, M., Bennett, D.A., Moran, A.E., Sacco, R.L., Anderson, L.M., Truelsen, T., O'Donnell, M., Venketasubramanian, N., Barker-Collo, S., Lawes, C.M., Wang, W., Shinohara, Y., Witt, E., Ezzati, M., Naghavi, M., Murray, C., Global Burden of Diseases IRFS and Group GBDSE (2013) Global and Regional Burden of First-ever Ischaemic and Haemorrhagic Stroke during 1990-2010: Findings from the Global Burden of Disease Study 2010. *The Lancet Global Health*, **1**, e259-e281. https://doi.org/10.1016/S2214-109X(13)70089-5

[2] Hart, R.G., Diener, H.C., Coutts, S.B., Easton, J.D., Granger, C.B., O'Donnell, M.J., Sacco, R.L. and Connolly, S.J. (2014) Cryptogenic Stroke/ESUS International Working Group. Embolic Strokes of Undetermined Source: The Case for a New Clinical Construct. *The Lancet Neurology*, **13**, 429-438. https://doi.org/10.1016/S1474-4422(13)70310-7

[3] Nishimura, R.A., Otto, C.M., Bonow, R.O., Carabello, B.A., Erwin, J.P., Guyton, R.A., O'Gara, P.T., Ruiz, C.E., Skubas, N.J., Sorajja, P., Sundt, T.M. and Thomas, J.D. (2014) ACC/AHA Task Force Members. 2014 AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation*, **129**, e521-e643. https://doi.org/10.1161/CIR.0000000000000031

[4] Bogiatzi, C., Hackam, D.G., McLeod, A.I. and Spence, J.D. (2014) Secular Trends in Ischemic Stroke Subtypes and Stroke Risk Factors. *Stroke*, **45**, 3208-3213. https://doi.org/10.1161/STROKEAHA.114.006536

[5] Yiin, G.S., Howard, D.P., Paul, N.L., Li, L., Luengo-Fernandez, R., Bull, L.M., Welch, S.J., Gutnikov, S.A., Mehta, Z. and Rothwell, P.M. (2014) Oxford Vascular Study. Age-Specific Incidence, Outcome, Cost, and Projected Future Burden of Atrial Fibrillation-Related Embolic Vascular Events: A Population-Based Study. *Circulation*, **130**, 1236-1244. https://doi.org/10.1161/CIRCULATIONAHA.114.010942

[6] Chugh, S.S., Havmoeller, R., Narayanan, K., Singh, D., Rienstra, M., Benjamin, E.J., Gillum, R.F., Kim, Y.H., McAnulty, J.H., Zheng, Z.J., Forouzanfar, M.H., Naghavi, M., Mensah, G.A., Ezzati, M. and Murray, C.J. (2014) Worldwide Epidemiology of Atrial Fibrillation: A Global Burden of Disease 2010 Study. *Circulation*, **129**, 837-847. https://doi.org/10.1161/CIRCULATIONAHA.113.005119

[7] Wolf, P.A., Abbott, R.D. and Kannel, W.B. (1991) Atrial Fibrillation as an Independent Risk Factor for Stroke: The Framingham Study. *Stroke*, **22**, 983-988. https://doi.org/10.1161/01.STR.22.8.983

[8] Go, A.S., Hylek, E.M., Phillips, K.A., Chang, Y., Henault, L.E., Selby, J.V. and Singer, D.E. (2001) Prevalence of Diagnosed Atrial Fibrillation in Adults: National Implications for Rhythm Management and Stroke Prevention: The AnTicoagulation and Risk Factors in Atrial Fibrillation (ATRIA) Study. *JAMA*, **285**, 2370-2375. https://doi.org/10.1001/jama.285.18.2370

[9] Ambrosy, A.P., Fonarow, G.C., Butler, J., Chioncel, O., Greene, S.J., Vaduganathan, M., Nodari, S., Lam, C.S., Sato, N., Shah, A.N. and Gheorghiade, M. (2014) The Global Health and Economic Burden of Hospitalizations for Heart Failure: Lessons Learned from Hospitalized Heart Failure Registries. *Journal of the American College of Cardiology*, **63**, 1123-1133. https://doi.org/10.1016/j.jacc.2013.11.053

[10] Chen, J., Normand, S.L., Wang, Y. and Krumholz, H.M. (2011) National and Regional Trends in Heart Failure Hospitalization and Mortality Rates for Medicare Beneficiaries, 1998-2008. *JAMA*, **306**, 1669-1678.

https://doi.org/10.1001/jama.2011.1474

[11] Blecker, S., Paul, M., Taksler, G., Ogedegbe, G. and Katz, S. (2013) Heart Failure—Associated Hospitalizations in the United States. *Journal of the American College of Cardiology*, **61**, 1259-1267. https://doi.org/10.1016/j.jacc.2012.12.038

[12] Lip, G.Y. and Gibbs, C.R. (1999) Does Heart Failure Confer a Hypercoagulable State? Virchow's Triad Revisited. *Journal of the American College of Cardiology*, **33**, 1424-1426.

[13] Amarenco, P., Davis, S., Jones, E.F., Cohen, A.A., Heiss, W.D., Kaste, M., Laouénan, C., Young, D., Macleod, M. and Donnan, G.A. (2014) Aortic Arch Related Cerebral Hazard Trial Investigators. Clopidogrel plus Aspirin versus Warfarin in Patients with Stroke and Aortic Arch Plaques. *Stroke*, **45**, 1248-1257. https://doi.org/10.1161/STROKEAHA.113.004251

[14] Benavente, O.R., Hart, R.G., McClure, L.A., Szychowski, J.M., Coffey, C.S. and Pearce, L.A. (2012) Effects of Clopidogrel Added to Aspirin in Patients with Recent Lacunar Stroke. *The New England Journal of Medicine*, **367**, 817-825. https://doi.org/10.1056/NEJMoa1204133