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Original Article

Study of Vascular Causes of Cognitive Dysfunction in Geriatric Patients

Authors
Dr Shishir Pandey[1], Dr Nimisha Mishra[2], Dr Anurag Churasia[3], Dr Pradeep Kumar[4]
Department of Medicine, Shyam Shah Medical College Rewa (MP), India
Corresponding Author
Dr Shishir Pandey
Department of Medicine, Shyam Shah Medical College Rewa (M. P.), India
Email: *shishir.pandey2001@gmail.com* Cell: 7354708185

Abstract
Introduction: *Prevalence of cognitive dysfunction in patient attending the hospital is remarkably higher (31.53%) than in general population (3.5%).Many, often treatable, cognitive dysfunction cases are taken complacently and, either not identified or, ignored being attributed to aging process.*
Objectives: *(1) To unravel the vascular causes of cognitive dysfunction in geriatric patient and to correlate its clinical picture.*
(2)To find out pattern of stroke, hypertension and cardic causes of cognitive dysfunction.
Material and Method: *Total 1077 patient screened out of which 175 patients fulfill the criteria of age above 65 years with clinical evidence of cognitive dysfunction and scoring of <24 on MMSE are included in study, diagnostic categorization, routine and special investigation were conducted out in each patient.*
Result: *Major vascular causes of cognitive dysfunction are stroke ,hypertension, and cardic respectively out of which stroke caused cognitive dysfunction in 33% of cases, hypertension in 19% cases, cardic disease caused cognitive dysfunction in 15% of cases.*
Conclusion: *The causes of cognitive dysfunction are multiple especially in geriatric age groups. Poor awareness and illiteracy towards causes appear as major susceptible factors for identification of various physical disorders eventually leading to gross dysfunctions. Many often cognitive dysfunctions are taken complacently, attributing to the aging process and allow reversibility to slip into irreversibility.*
Keywords: *cognitive dysfunction, MMSE, vascular.*

INTRODUCTION

India is an ageing society [1]with the rate of growth of ageing population exceeding the growth of the general population. [2] In India, it is estimated that the elderly in the age group 60 years and above is expected to increase from 71 million in 2001 to 179 million in 2031 and in the case of those 70 years and older, the projected increase is from 27 million in 2001 to 132 million in 2051.[3]

Prevalence of cognitive dysfunction in general population in elderly is 3.5%[4]where as prevalence of mild cognitive impairment in patients attending the hospital is 31.53%[5].

Many often treatable cognitive dysfunctions are wrongly attributed simply to the ageing process only. It is just like to blame all the mental disorders of children, growing up in urban slums, simply to their younger age and slum area. The

current society and contemporary fast life style are unable to pace with rapidly increasing geriatric mass. They eventually poised to various physical and psychosocial problems due to extreme of age. The health care delivery systems, moreover offer priority for younger generation then to those neglected old age population. Despite the recognition of their handicaps, the problems of old age often remain neglected both in the hand of health personnel and the social reformers and many often we fail to implement the effective measures to meet their demands which eventually lead to more physical as well as cognitive dysfunctions.

The cause of cognitive dysfunction can be irreversible such as cerebral infract and cerebral hemorrhage or any type of vascular dementia, or it can be reversible such as cardiovascular disease, drugs etc. If the cause of cognitive dysfunction can be found out early we can stop the development of permanent cognitive deficit.

Realizing an immense need, the present study was carried out in patients admitted in Sanjay Gandhi Hospital.

MATERIAL AND METHOD

The present study was conducted in all geriatric patients above 65 year, attending Department of Medicine in Sanjay Gandhi Memorial Hospital, Rewa (M.P.) for 1 year, total 1077 patient screened out of which 175 patients fulfill the criteria of age above 65 years with clinical evidence of cognitive dysfunction and scoring of <24 on MMSE are included in study, diagnostic categorization, routine and special investigation were conducted out in each patient.

RESULT

Table 1 Vascular causes of cognitive dysfunction (n=148)

S. No.	Causes of cognitive dysfunction	No. of cases	%
1.	Stroke	48	33.0
2.	Hypertension	28	19.0
3.	Cardiovascular disease	22	15.0
	Total	98	67

Majority of patients contracted with stroke (22%) as major cause, hypertension (24%) is the second common cause and cardiovascular disease(14%). Overall 67% which signifies that vascular causes constitute a major part in cognitive profile in geriatric patient.

Table2 Pattern of stroke causing cognitive dysfunction

S. No.	Stroke		No. of cases	%
1.	Infract	Embolic	18	12.0
		Thrombosis	8	6.0
2.	Hemorrhage	Intracerebral	16	11.0
		Subarachnoid	6	4.0
	Total		48	33.0

In present study stroke is the major cause of cognitive dysfunction (33%).Infract is the major cause of stroke i.e. 18% in which embolic type constitute 12% and thrombotic type 6%. Hemorrhage constitutes 16% of cases in which majority is of intracerebral (11%) followed by subarachnoid hemorrhage (6%).

Similar findings were found when neuropsychol-ogical screening test was applied among elderly population with cognitive complaints prevalence of stroke (per 1000 elderly population-60 years) was 33.93%.[6] Most of patient was hypertensive which was itself associated with development of neurological disorder such as stroke,[7]cognitive dysfunction in stroke patient is mainly due inappropriate ADH secretion.

Table 2: Pattern of hypertension causing cognitive dysfunction

S.No.	Cause	No. of cases	%
1.	Hypertensive hemorrhage	16	11.0
2.	Hypertensive encephalopathy	12	8.0
	Total	28	19.0

Hypertensive hemorrhage cause cognitive dysfunction in 11% of cases followed by hypertensive encephalopathy which cause cognitive dysfunction in 8% of cases.

Table: 3 Shows correlation of cognitive dysfunction with hypertension (n=148)

S. N.	Hypertension grading	No. of cases	%
1	Normal (SBP 90-119 & DBP 60-79)	20	14.0
2	Pre-hypertension (SBP 120-139 or DBP 80-89)	34	23.0
3	Stage 1Hypertension (SBP 140-159 or DBP 90-99)	54	36.0
4	Stage 2 Hypertension (SBP ≥160 or DBP ≥100)	40	27.0
	Total	148	100

Majority of the patient having cognitive dysfunction had stage 1 hypertension (36.0%) followed by stage 2 hypertension (27%) and pre-hypertension (23%). Normotensive patients were only 14%.

HYPERTENSION

Hypertension causes changes in brain that cause cognitive dysfunction. hypertension cause reduced cerebral blood flow and metabolism, particularly in certain brain regions, such as the frontal and temporal lobes and subcortical areas, it is associated with development of neurological disorder such as stroke [8], Alzheimer's disease [9-11], and vascular dementia.[12-14] Patient with hypertension showed cognitive dysfunction in several domains, such as executive function, memory, calculation and orientation.[15-17] Drugs such as hydrochlorothiazide for hypertension develops a low serum sodium, which cause cognitive dysfunction.

Table 4 Shows cardiovascular causes of cognitive dysfunction

S.No.	Cardiovascular cause	No. of cases	%
1.	Cardiac failure	12	8.0
2.	Arrhythmia	8	6.0
3.	Drugs	2	1.0
	Total	22	15

CARDIOVASCULAR DISEASE

Cardiovascular cause includes cardiac failure as major cause (8.0%) followed by arrhythmia (6%) and drugs.

Cardiovascular disease risk factors are increased in elderly with cognitive impairment.[18] Heart failure is independently associated with cognitive impairment.[19] The mechanism of cognitive deficits in cardiac patients may be related to multiple infracts, acute or chronic hypoxic damage secondary to arrhythmias, cardiac failure, or small vessel disease of the brain.[20] Drugs used to treat heart failure especially digitalis, can produce a wide variety of mental aberrations including delirium.[21] During hospitalization up to 72% of the patients had mild to severe impairment in one or more cognitive areas, delayed recall being the most common deficit during hospitalization. Six months later, 29% of patients continued to be impaired and all had deficits in delayed recall.[22] Patient with heart failure experience problems with memory, attention, speed and flexibility of mentation, reaction time and concentration.[23] Cerebral infraction and cerebral hypo perfusion either alone or in combination might be the underlying pathophysiology.[24] Low output states such as systemic hypotension [25] and low ejection fraction [26] also have been implicated as cause of cognitive impairment in patients with heart failure.[27] Cognitive impairment may be more common in patients with heart failure than in general population.[28] Other investigators have reported that 23 to 53% of patients with heart failure have evidence suggestive of cognitive impairment.[29] The risk of cognitive impairment in patients with heart failure was 1.96 times the risk in general population, 65 years or older.[30]

CONCLUSION

Studies from different geographical area have been published from time to time regarding the cognitive dysfunction in geriatric patient, but there are very few studies published regarding its association with vascular causes. Present study revealed importance of vascular causes and its association in causing cognitive dysfunction in hospital admitted geriatric patients, so that in future we can intervene early and prevent complication.

The cause of cognitive dysfunction is multi duodenal in geriatric age group. Large number of causes is reversible hence proper steps therefore should be directed towards primary prevention of these causes.

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