KISA RAPOR   SHORT COMMUNICATION

CLINICAL STUDY OF 6 PATIENTS WITH DYSARTHRIA-CLUMSY HAND SYNDROME.

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ABSTRACT

Introduction: Although dysarthria-clumsy hand syndrome (DCHS) is a well known, infrequent subtype of lacunar syndrome, there is little information on its anatomic specificity, spectrum of associated clinical characteristics, and etiological mechanisms. Clinically lacunar syndromes are classified according to Fisher's criteria into pure motor hemiparesis, sensorimotor stroke and ataxic hemiparesis including DCHS. We present the clinical description of DCHS based on data collected prospectively in our stroke unit. Methods: From 414 acute ischemic stroke patients included in a hospital based prospective study over a 2-year period, 83 patients with lacunar strokes and 6 patients having DCHS were identified. All participants underwent an evaluation including medical history, physical examination, standardized blood tests, extracranial Doppler ultrasonography, electrocardiogram, a brain computed tomography and/ or magnetic resonance imaging, and echocardiography; and all were classified according to TOAST criteria. Results: DCHS accounted for 1.4% of all acute ischemic stroke, and 7.2% of all lacunar syndromes. The investiagtions on the underlying etiology supported the lacunar hypothesis in all patients presenting with DCHS, and no patients with DCHS had an atherotrombotic/cardioembolic origin nor intracerebral haemorrhage. The internal capsule (66.6%, n=4), pons (16.6%, n=1), and basal ganglia (16.6%, n=1) localizations found to be associated with DCHS. Outcome was favorable in compared with other types of strokes (symptom free at discharge 66.6%, n=4). Conclusion: To present the etiology and risk factors underlying classical lacunar strokes will help better understanding of these subtype of infarctions and differentiate from small infarctions caused by other etiologies.

ÖZET

Giriş: Dizartri-beceriksiz el sendromu (dysarthria-clumsy hand syndrome, DCHS) oldukça iyi bilinen laküner sendromların az görülen bir alt tipi olmasına karşın, anatomik özellikleri, klinik özellikleri, ve etiyolojik mekanizmaları henüz tam olarak aydınlatılamamıştır. Klinik olarak laküner sendromlar Fisher kriterlerine göre saf motor hemiparezi, duyusal-motor inme ve DCHS da dahil olmak üzere ataksik hemiparezi şeklinde sınıflandırılmıştır. Metot: Bu yazıda inme ünitemize başvurmuş olan hastalarımızdan elde edilen prospektif bilgilere dayalı olarak DCHS'unun klinik tanımını sunmak istedik. Akut iskemik inme ile başvuran 414 hasta, yaklaşık 2 yıllık bir izlemde, hastane-bazlı prospektif değerlendirmeye alınmış, laküner sendromu olan 83 hasta ve DCHS tanısı alan 6 hasta tanımlanmıştır. Tüm hastalarda detaylı anamnez, fizik muayene, standart kan testleri, ekstrakraniyal doppler ultrasonografi, elektrokardiyogram, beyin bilgisayarlı tomografisi ve/veya manyetik rezonans inceleme, ve ekokardiyografi olmak üzere standart protokol uygulanmış, ve TOAST kriterlerine göre iskemi alt tiplemesi yapılmıştır. Sonuçlar: DCHS tüm akut iskemik inmelerin %1.4'ünü, laküner sendromların ise %7.2'sini oluşturmuştur. Yapılan geniş tetkiklerde, DCHS tanısı almış tüm hastalarda laküner sendrom hipotezi ile uyumlu olarak, aterotrombotik/kardiyoembolik etken ya da intraserebral kanama saptanmamıştır. Lezyon yerleşimi incelendiğinde, internal kapsül (%66.6, n=4), pons (%16.6, n=1), ve bazal ganglia (%16.6, n=1) bölgelerinin DCHS ile ilişkili olduğu izlenmiştir. Prognoz diğer inme alt tiplerine kıyasla oldukça iyi bulunmuştur (hastaların %66.6'sı taburcu edildiğinde semptomsuz, n=4). Sonuç: Laküner sendromların etiyolojisine ve risk faktörlerine yönelik klinik bilginin sunulması, klasik laküner sendromların diğer inme nedenlerine bağlı gelişen küçük enfarktlardan ayırıcı tanısının yapılmasına yardımcı olacaktır.

INTRODUCTION

Cerebrovascular Diseases (CVD) are the third most common causes of death, following cardiovascular diseases and cancers. In a study by Bamford et al. (Bamford J et al., 1987), it was shown that lacunar infarctions constitute 21% (n=108) of the ischemic CVD (n=515 first-ever strokes).

In another study, approximately 19 percent of all strokes were of the lacunar variety with lacunar strokes (Davidson KW, 1988). The term lacuna or lacunar cavity defines the pathological lesion while clinical pictures due to lacuna or lacunes are referred to as 'lacunar syndromes' (Loeb C, 1989). The lacunar syndromes include: (i) the typical lacunar syndromes or lacunar

syndromes proper-pure motor hemiplegia, pure sensory stroke, ataxic hemiparesis including dysarthria-clumsy hand, sensorimotor stroke and abnormal movement syndromes, (ii) reversible ischemic attacks, (iii) other clinical syndromes which may be due to lacunar lesions such as suprabulbar palsy; lacunar dementia, or subacute arteriosclerotic encephalopathy (or Binswanger's disease). Lacunar strokes result from occlusion of penetrating arteries in the deeper, subcortical parts of the cerebrum and brain stem. In this study, we present the clinical description, location, sizes and presumed causes of DCHS based on data collected prospectively in our follow-up department, as it is a rare subtype of lacuner syndromes.

METHODS

In this prospective study, 414 patients (197 females, 217males) with acute ischemic stroke, admitted to the Stroke Unit of the Neurology Department of Cerrahpasa Medical School, Istanbul, Turkey, between January 2002-2004 were included. Cerebral infarction was defined as a focal neurological deficit of sudden onset that persisted more than 24 hours. The diagnosis of ischemic stroke was based on the clinical findings and a brain computed tomography (CT) or magnetic resonance imaging (MRI). 118 patients (28.6%) out of 414 acute ischemic stroke had a brain CT scan only, and the remaining 296 patients (71.4%) had a diagnosis guided by MRI. All participants underwent an evaluation including medical history, physical examination, standardized blood tests, extracranial Doppler ultrasonography, 12-lead ECG, and transthoracic echocardiography. The patients were subjected to transoesophageal echocardiography, when necessary. All patients were classified according to TOAST criteria (Adams HP Jr et al., 1993).

Subgrouping of the strokes was classified according to the criteria adopted by 'stroke data bank' of National Institute of Neurological Disorders and Stroke (Kaul S et al., 2000). In particular, "lacunar infarction" was defined as a focal neurological deficit in either carotid artery or vertebrobasilar territory, lasting for more than 24 hours, with a cranial imaging showing only a small lesion of <1.5 cm diameter in a subcortical area of appropriate hemisphere. In patients with non-lacunar, large vessel stroke, differently, a CT scan showed a cortical, subcortical or combined lesion of >1.5 cm diameter in the absence of an obvious cardioembolic source. Cardioembolic stroke was characterised by sudden onset of maximal neurological focal deficit with CT features consistent with cardioembolism in the presence of an acceptable potential cardiac source of embolism. According to Fisher's criteria (Fisher CM, 1982), patients were classified as pure motor hemiparesis, sensorimotor stroke and ataxic hemiparesis including dysarthria clumsy hand syndrome. Cases who had higher brain dysfunctions or brainstem syndromes were excluded. Patients with dysarthria clumsy hand syndrome were examined by neurologist (G.B., M.B., B.I.) to differentiate hemiparesis from 'clumsiness' in DCHS.

Several laboratory parameters and cardiovascular risk factors such as age, sex, dyslipidemia, smoking, presence of arterial hypertension, diabetes mellitus, glucose level, atrial fibrillation and coronary heart disease were determined. Plasma cholesterol levels were measured in mg/dL. The levels of triglyceride (TG) more than 150 mg/dL, low-density lipoprotein (LDL) more than 130 mg/dL, high-density lipoprotein (HDL) lower than 40 mg/dL for males and lower than 50 mg/dL for females were defined as the criteria for the diagnosis of dyslipidemia. Patients on medication with the cholesterol-lowering drugs were also accepted as having dyslipidemia. The history of smoking was questioned and patients were grouped as non-smokers and ever-smoked. Presence of arterial hypertension was determined if documented systolic arterial blood pressure was higher than 140 mmHg and/or diastolic arterial blood pressure was higher than 90 mmHg, or if the patients were on medication with antihypertensive medication. Another known risk factor, diabetes mellitus, was reported in patients with antidiabetic treatment or was diagnosed during hospital (glucose levels higher than 110 mg/dL). Coronary heart disease was reported in the presence of documented previous myocardial infarction or angina pectoris, bypass surgery, or more than 50 % angiographic stenosis of major coronary artery. All participants underwent carotid doppler examination to determine carotid wall intima to media thickness with high-resolution B-mode ultrasonography (Esaote Biomedica AU4). The participants were then divided into two groups based on their carotid wall thickness; (i) one group as having either normal examination, or intimal thickening,

irregularities or plaques without significant narrowing, and (ii) second group with the presence of stenosis >50%.

RESULT

414 patients (217 men and 197 women with a mean age of 63.7+10.9 years [range; 51 to 76 years]) admitted to the Stroke Unit of the Neurology Department of Cerrahpasa Medical School, between January 2002-2004 were included in this study. Out of 414 patients with acute ischemic stroke, 83 patients had lacunar infarctions (20%); 6 patients of these 83 patients admitted complaining of dysarthria and clumsiness in their upper extremities.

All of 6 patients complained of acute-onset dysarthria of variable degree, and clumsiness in their upper extremities. In neurological examination, right upper monoparesis was found in three of them, left upper monoparesis in one patient, right-sided hemiparesis with the involvement of the face in one patient, and right-sided upper monoparesis with the involvement of the face in one patient. Sensorial disturbances were present in three of the patients accompanying their paresis. Light touch was decreased over the upper extremity in all three patients, upper extremity with face, and both upper and lower extremity in each. None complained of dysphagia.

Ischemic cerebrovascular diseases were classified according to the etiology, as atherothrombotic (33.1%, 137 patients), cardioembolic (26%, 108 patients), lacuner (20%, 83 patients) strokes, other minor etiologic group (6%, 25 patients) and strokes of undetermined etiology (14.9%, 61 patients). In all patients with DCHS, imaging studies revealed lacunar type of stroke. In none of the patients, cardioembolic nor atherothrombotic origin was detected. Cerebrovascular diseases were also examined as territory of the causative artery. Three patients had left-sided infarction and one had right-sided infarction located in the capsula interna, in the territory of the deep lenticulate branches of the middle cerebral artery. One patient revealed infarction on the left basal ganlglia and centrum semiovale, and one showed infarction stiuated on the left pons, probably secondary to the occlusion of the paramedian branches.

Patients with DCHS had a mean age of 59.8+7.0 (ranging between 51 and 65), whereas the mean age of all patients with lacunar infarctions was

63.8±12.2. Five out of the six patients complaining of DCHS were male (83.3%), only one patient was female. The male to female ratio in total lacuner infarctions group was 2:3 (44.6% of the patients being male). All of the five male patients with DCHS were smokers, female patient with DCHS was a. non-smoker. Overall smoking was 24.1% in total group. About 83.3% (n=5) and 75.9% of the patients (n=63) had a history of hypertension in patients with DCHS and in patients with other types of lacuner syndromes, respectively. Two patients out of 6 DCHS patients (33.3%) had dyslipidemia; 9.6% (n=8) of the patients with lacuner syndromes, on the other hand, had dyslipidemia. Fifty percent (n=3) and 26.8% (n=22) of the cases had diabetes mellitus in DCHS patients and patients with lacuner syndromes, respectively. None of the patients with DCHS had atrial fibrillation, history of coronary heart disease, nor the presence of plaques in the carotid arteries leading significant stenosis. On the other hand; 18.1% (n=15) of the patients in the lacuner syndromes group had documented heart disease and 8.4% (n=7) of them had plaques in the carotid arteries leading significant stenosis (>50%) (Table 1).

Table 1. The risk factors of patients with lacunar infarction and patients with DCHS.

Patient characteristics	All lacuner infarcts (n=83)		DCHS (n=6)	
	n	%	n	%
Male	37	44.6	5	83.3
Smoking	20	24.1	5	83.3
Hypertension	63	75.9	5	83.3
Diabetes	22	26.8	3	50
Dyslipidemia	8	9.6	2	33.3
Coronary heart disese	15	18.1	0	0
DUS* (>50% stenosis)	7	8.4	0	0

*Doppler ultrasonographic examination

Overall outcome was good, with a 0% mortality in hospital. Symptoms were absent in 66.6% (n=4) of patients with DCHS indicating a very bening course.

DISCUSSION

We demonstrated that the frequency of lacunar infarctions (20%) and DCHS (1.4%) in

our stroke registry, as other clinical characteristics of these syndromes, is similar to that in most of the western registries (Bamford J et al., 1987; Bogousslavsky J et al., 1988; Mohr JP et al., 1978); but higher frequencies (27-30%) were reported from other Asian countries with predominant population of Chinese origin (Davis LE et al., 1990; Huang CY et al., 1990), which has been attributed to the ethnic factors. Analysis of 893 patients of ischemic stroke in the stroke registry of Nizam's Institute of Medical Sciences reported that 16% of patients had lacunar infarction. Dysarthria-clumsy hand syndrome accounted for 14% of these cases (Kaul S et al., 2000). In a study by Arboix et al., DCHS accounted for 1.6% of all acute strokes, 1.9% of acute ischemic stroke and 6.1% of lacunar syndromes; the dysarthria-clumsy hand syndrome was observed in four (2%) of the cases. (Arboix A et al., 2004). In another study, dysarthria-clumsy hand syndrome was observed in 11.7% and associated with pure motor hemiparesis and/or ataxic hemiparesis in 27.9% of the patients (Urban PP et al., 2001).

A brain CT and/or MRI was revealed lacunar type of stroke in all patients with DCHS in our study, and in none of the patients cardioembolic nor atherothrombotic origin was detected. Emboligenic cardiac disease was also found as an unlikely risk factor for lacunar infarction (Kaul S et al., 2000), but it was stressed that in a small percentage of their patients, high risk cardioembolic sources were found in the absence of other risk factors for stroke. Artery to artery embolus is shown as a very uncommon cause of lacunar stroke and Kaul et al. agreed with that patients with lacunar infarcts may not require detailed evaluation of carotid arteries (Kaul S et al., 2000). In one study by Arboix et al., results supported the lacunar hypothesis in 94.3% of patients; atherothrombotic and cardioembolic infarction occurred in only one patient each; and no patient with DCHS had intracerebral haemorrhage (Arboix A et al., 2004). In patients with AH including DCHS, no cardioembolic sources nor large arterial lesions could be detected in another study as we demonstrated in our study (Tei H et al., 1991). The lesions were found to be due to small-vessel disease in 52.9%, cardioembolism in 11.8% and large-vessel disease in 4.4% in the study of Urban PP et al. (Urban PP et al., 2001).

Four of our patients showed infarctions located in the capsula interna (66.6%), one patient revealed infarction on the left basal ganlglia and centrum

semiovale (16.6%), and one showed infarction stiuated on the left pons (16.6%). In one study, the locations of lacunes that significantly associated with DCHS were detected in internal capsule (40%), pons (17%), and corona radiata (8.6%) (Arboix A et al., 2004). Infarctions were located in the lower part of the primary motor cortex (5.9%), middle part of the centrum semiovale (23.5%), genu and ventral part of the dorsal segment of the internal capsule (8.8%), cerebral peduncle (1.5%), base of the pons (30.9%), and ventral pontomedullary junction in another study (1.5%) (Urban PP et al., 2001).

Risk factors for lacunar syndromes also revealed similar results. Our results were quite higher in DCHS patients with the incidence of hypertension as 83.3%, diabetes as 50%, hyperlipidemia as 33.3%, and history of smoking as 83.3%. Besson et al. found that the prevalences of arterial hypertension and cigarette smoking were higher in lacunar stroke group, with a significant difference in age between subgroups without interaction of sex (Besson et al., 2000). The common risk factors in the study of Kaul S et al. also included hypertension (62%), diabetes (38%) and smoking (28%). Six percent had an underlying cardiac source of embolism and none had significant extracranial carotid atherosclerosis. In 22% of patients, no obvious risk factors could be identified. An analysis of 227 patients with lacunar infarcts showed that arterial hypertension was present in 164 patients (72%), diabetes mellitus in 64 patients (28%), and heart disease in 58 patients (26%) (Arboix A et al., 2004).

The overall prognosis of lacunar syndromes, as DCHS is favorable. In our study, outcome was good with a mortality rate of 0% in hospital; and symptoms were absent in 66.6% of patients (n=4) in 1-week follow-up. Lacunar infarcts were clearly defined as an entity with characteristic clinical features and an excellent short-term prognosis in the study of Arboix et al. (Arboix A et al., 2004). After the acute phase, mild or no neurologic disability was detected in 178 patients (78.4%), moderate disability persisted in 48 patients (21.1%), and severe disability was recorded in one case (0.4%) (Arboix A et al., 2004)

There are some shortcomings of this paper. There is still a contraversy existing in the literature about the definitive description of DCHS, as the other etiologies could also lead lacuner infarcts. This explores the importance of clinical epidemiologic data in understanding of lacuner infarcts. This study is not a population based

study. Patients and risk factors evaluated in this study may be seen unreflective of the population. However, bearing 1/6 of the population, Istanbul brings people together from various socio-economic backgrounds and different regions around Turkey. The patients admitted to our hospital do not consist of a homogenous group in terms of income level, education level or profession. In other words, the patient profile of our hospital, in fact, may reflect the whole Turkish population. In addition, a comparative statistical analysis is missing, as the number of the patients in the DCHS group is quite less.

We conclude that the frequency, risk factors and clinical profile of this infrequent subtype of lacunar infarctions, dysarthria-clumsy hand syndrome, in our stroke registry is similar to those of most western registries. Acquiring and presenting knowledge regarding the etiology and risk factors underlying the classical lacunar presentations would facilitate the differentiation of lacunar infarctions from other small infarctions caused by different etiologies.

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