

CLINICAL DESCRIPTION OF HEMODIALYSIS HEADACHE IN END-STAGE RENAL DISEASE PATIENTS

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Abstract – **Background:** Hemodialysis (HD)-related headaches are a common complaint of patients undergoing this procedure. **Objective:** To determine the frequency and clinical characteristics of headache in patients undergoing HD and to discuss their diagnostic criteria. **Method:** The present study assessed, in a prospective manner, a series of patients consulting at a HD center in Aracaju, Sergipe, Brazil, from November 2007 to January 2008. Only patients with HD-related headaches without previous history of primary headache were diagnosed as isolated HD headache (HDH). **Results:** Headache was reported by 76.1% of the patients studied. Prior to beginning dialysis, 47.9% had migraine without aura, 6.7% migraine with aura, 0.6% hemiplegic migraine, 5% episodic tension-type headache, and 2.5% migraine and tension-type headache. HDH was diagnosed in 6.7% of the patients, the most prevalent features being diffuse or temporal region location, bilateral headache, throbbing nature, and moderate severity. Seven patients with headaches between the sessions were not classified. **Conclusion:** While the pathophysiology of HDH is unknown, to diagnose patients with HDH or other possible HD-related headaches remains a challenge.

KEY WORDS: hemodialysis headache, end-stage renal, clinical description, diagnostic criteria.

Caracterização clínica da cefaléia da diálise em pacientes renais crônicos

Resumo – Cefaléias relacionadas ao programa de hemodiálise é uma queixa comum. **Objetivo:** Determinar frequência e características clínicas das cefaléias em pacientes em regime de hemodiálise e discutir critérios diagnósticos. **Método:** Foi feita uma avaliação clínica prospectiva de pacientes cefalêicos em um serviço de hemodiálise em Aracaju, Sergipe, Brasil, de novembro de 2007 a janeiro de 2008. Apenas pacientes sem antecedente de cefaléia primária receberam diagnóstico de cefaléia da diálise isolada. **Resultados:** Cefaléia esteve presente em 76,1% dos pacientes estudados. Como antecedente de cefaléia, 47,9% tinham migrânea sem aura, 6,7% migrânea com aura, 0,6% migrânea hemipléica, 5,5% cefaléia tensional episódica, e 2,5% associação de migrânea e cefaléia tensional. A cefaléia da diálise isolada foi diagnosticada em 6,7% dos pacientes e as localizações difusas e temporais, cefaléia bilateral, pulsátil, e intensidade moderada foram as características mais prevalentes. **Conclusão:** Enquanto a fisiopatologia da cefaléia da diálise for desconhecida, o diagnóstico de cefaléia da diálise ou de outras possíveis cefaléias relacionadas à diálise permanecerá um desafio.

PALAVRAS-CHAVE: cefaléia da diálise, insuficiência renal terminal, características clínicas, critérios diagnósticos.

At present, there are more than 500 hemodialysis (HD) centers in Brazil, serving an estimated population of 70,000 patients¹⁻². Like the general population, these patients have a high prevalence of headache, according to studies, such complaints are found in circa 70% of the patients³⁻⁵. The hemodialysis headache (HDH), according to Goksel et al. and Göksan et al., was found in 30% and 48% of the patients undergoing HD, respectively⁶⁻⁷.

The diagnostic criteria of HDH were established by the latest classification of International Headache Society (ICHD II, 2004), but its pathophysiology is still not completely understood⁶⁻⁸. Some reports have identified possible factors related to HD crises of headache, such as changes in arterial pressure and in the levels of magnesium and sodium in the blood^{3,6,7,9}.

The aim of this study is to determine the frequency

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and clinical characteristics of headache in patients undergoing HD in a HD center and to discuss the diagnostic criteria of HDH proposed by the IHS.

METHOD

This prospective and descriptive study was carried out in the Nephrology Clinic of Sergipe (CLINESE). The patients were followed from November 2007 to January 2008. All patients with chronic renal failure included in this study had been in the HD program for at least 6 months and were regularly undergoing three HD sessions per week. The HD sessions usually lasted three to four hours.

We used a semi-structured questionnaire during the interviews and the ICHD II (2004) diagnostic criteria to classify the headache.

Diagnostic criteria

(A) At least 3 attacks of acute headache fulfilling criteria C and D. (B) Patient is on hemodialysis. (C) Headache develops during at least half of hemodialysis sessions. (D) Headache resolves within 72 hours after each hemodialysis session and/or ceases altogether after successful transplantation.

The frequency and clinical characteristics of headaches prior to and during the HD program were recorded by interview. The intensity of pain was quantified using the Visual Analogical Scale (VAS) score. Duration of the HD program, number of HD sessions per week, age, etiology of chronic renal failure, and other data were confirmed by accessing the patients' medical files. The dialysis solution contained bicarbonate in all sessions.

This study was approved by the Ethics in Research Committee of Federal University of Sergipe – UFS (Nº 2363.0.000.107-07). All patients enrolled in this study provided their individual written informed consent.

RESULTS

The total group of patients undergoing HD was composed by 238 individuals, out of which 177 satisfied the inclusion criteria of having been in the HD program for 6 months or over. Those unable to supply all information required in the research protocol and those who refused to participate in the study were excluded (n=10). Four patients were excluded due to death. Thus, we assessed 163 patients in this study. Ninety-six (58.9%) were men and 77

Table 1. Characteristics of HDH (n=11).

Characteristics		Frequency, % (n)
Intensity	Moderate	63.6% (7)
	Severe	36.4% (4)
Quality	Dull	18.2% (2)
	Throbbing	81.8% (9)
Location	Vertex	9.1% (1)
	Diffuse	27.3% (3)
	Frontal	9.1% (1)
	Temporal	27.3% (3)
	Occipital	18.2% (2)
	Occipito-temporal	9.1% (1)
Photophobia		18.2% (2)
Phonophobia		36.4% (4)
Nausea		9.1% (1)
Duration	≤ 4 hours	72.7% (8)
	>4 hours	27.3% (3)

Moderate: 3–7 in VAS score; Severe: 8–10 in VAS score.

(41.1%) were women, their mean age was 46.22 ± 14.3 years. The mean duration of chronic HD therapy was 34.4 ± 22.8 months. Eighty-one patients (49.7%) underwent HD on Mondays, Wednesdays and Fridays, and eighty-two (50.3%) on Tuesdays, Thursdays and Saturdays.

The causes of end-stage renal disease were hypertensive nephrosclerosis (18.4%), diabetic nephropathy (14.1%), glomerulopathy (11.7%), polycystic kidney disease (4.9%), obstructive uropathy (2.5%), nephropathy caused by drugs (1.8%), unknown etiology (44.1%) and other causes (2.5%).

Headache prior to or during the HD program was reported by 124 (76.1%) patients. Ninety-eight (60.1%) patients had a history of headache, fulfilling the criteria for migraine without aura (78 patients, 47.9%), migraine with aura (6 patients, 6.7%), hemiplegic migraine (1 patient, 0.6%) and episodic tension-type headache (9 patients, 5.5%). Four patients (2.5%) reported headaches with characteristics of migraine and tension-type headache. Forty-two patients (33.9%) had an improvement of at least 80% in their frequency of attacks.

Headaches related to viral or bacterial infections, as well as other types of secondary headaches, were not classified as previous history of headache.

Table 2. Characteristics of HDH (n=11).

Characteristics		Frequency, % (n)
Preferential day of the attacks	None	81.8% (9)
	Monday or Tuesday	18.2% (2)
Time elapsed between the beginning of the dialysis session and the onset of headache	< 1 hour	0% (0)
	1–1.9 hours	27.3% (3)
	2–2.9 hours	36.4% (4)
	3–4 hours	27.3% (3)

Table 3. Characteristics of headaches presented by subjects between the HD sessions (n=7).

Characteristics		Frequency, % (n)
Intensity	Moderate	71.4% (5)
	Severe	28.6% (2)
Quality	Dull	57.1% (4)
	Throbbing	43.9% (3)
Location	Vertex	28.6% (2)
	Diffuse	28.6% (2)
	Temporal	14.3% (1)
	Fronto-temporal	14.3% (1)
	Occipito-temporal	14.3% (1)
Photophobia		14.3% (1)
Phonophobia		42.9% (3)
Nausea		14.3% (1)
Worsened during exertion		28.6% (2)
Frequency per month	≥ 6 attacks	28.6% (2)
	< 6 attacks	71.4% (5)
Duration	≤ 4 hours	85.7% (6)
	> 4 hours	14.3% (1)

Moderate: 3–7 in VAS score; Severe: 8–10 in VAS score.

Eighty-two patients (50.3%) reported headache during the HD sessions. Seventy-six (46.6%) kept having these attacks during the study, and 78.7% had been having them since the start of their HD program. In 56.6% of this group, the attacks occurred in the final hour of the session and 68.4% had no day of preference.

Of these 76 patients, 29 (38.2%) reported suffering attacks in at least half of the hemodialysis sessions. Of these 29 patients, 11 (37.8%) denied having had primary headache prior to the HD program. Thus, HDH was diagnosed in 11 patients interviewed (6.7%). The characteristics of the HDH found in this study are shown in Tables 1 and 2.

In the HDH group, the mean age was 48.8±11.2 years and 90.9% were men. The mean HD duration was 32.9±22.8 months.

Ten patients (90.9%) with HDH reported bilateral pain and none of them reported any symptoms that could be considered as aura. The mean duration of attacks was 3.6±3.2 hours. All patients with HDH presented headache throughout the study. Nine patients of this group (81.8%) had been presenting this headache since the start of the HD program, one patient since the third semester and another since the fourth semester. Concerning possible triggering factors, three patients associated the attacks with arterial hypertension (27.3%), one (9.1%) with loss of weight during the HD sessions and one (9.1%) reported association with both conditions.

Common analgesics, such as dipyrone and paracetamol, were the treatment of choice during the attacks. None of the patient reported any attempt at prophylactic treatment.

The seven patients who did not have headache prior to the beginning of the HD reported headache between the sessions. Five of these (71.4%) had been presenting HD-related headache since the start of the HD program, one since the third semester and another since the sixth semester. Six of them also had headache during the HD, including four with a diagnosis of HDH. In this subset of patients the mean age was 52.6±6.1 years and five were men. The characteristics of the pain in this group are shown in Table 3.

DISCUSSION

In our study, headache was reported by 76.1% of the patients, a result similar to those of Bana et al.³ and Antoniazzi et al., who found a prevalence of 70% and 70.7%, respectively³⁻⁴.

As in the study of Antoniazzi et al.⁹, in which 67.8% reported a history of headache, we also found a high frequency of this complaint (60.1%). According to Antoniazzi et al.¹⁰, 40.7% in this group reported a dramatic improvement in their headaches after beginning HD. In our study, 33.87% in this subset obtained a decrease of at least 80% in the frequency of the attacks, excluding the attacks during the HD⁴.

Headaches associated with HD were also frequent, as we found in 76 patients (46.6%) who reported suffering from headache during the sessions. Antoniazzi et al.¹⁰, after evaluating 123 individuals, found 50 patients who reported the same complaint⁴.

In the general recommendation of ICHS-II, in agreement with what has been said by Bana et al.³, it is possible to diagnose a kind of secondary headache in a patient with a history of primary headache³⁻⁸. The diagnostic criteria are essentially clinical. However, as there are no clinical and objective criteria clearly defining a relationship or differentiation between the attacks during the HD sessions and the primary headache. Therefore, the authors have decided to classify as HDH only the headaches that occurred in the patients without a history of primary headache prior to the start of the HD program.

It was observed that 18 patients who presented headaches in at least half of the HD session, also reported a history of migraine and tensional headache. Evaluating the characteristics of these headaches, it was not possible to identify any important differences with the primary headache, in order to consider the possibility of a new headache in their medical history. This could explain, in part, the low frequency of HDH (6.7%) in our study. According to Antoniazzi et al.^{9,10}, 34 patients received a diagnosis of HDH, including individuals with a history of primary head-

aches. Goksel et al.⁶ and Göksan et al.⁷ reported a higher prevalence, even after excluding the patients with headache prior to the beginning of the HD program^{4,6,7}.

When all patients with headache during the HD were assessed, 56.6% of the attacks occurred in the last hour of the sessions. A similar percentage was found by Antoniazzi et al.⁹⁻¹⁰ (62%). However, when only the individuals with HDH were assessed, only 27.3% of them reported their attacks during that period.

Bana et al.³ have proposed that a longer interval between the sessions could be related to the incidence of headache during the HD³. As the patients have three sessions per week every other day, we expected a higher incidence of attacks in Mondays and Tuesdays. However, in our study, the majority denied having a preferential day for headache during the HD.

Like Antoniazzi et al.^{9,10}, the present work also observed patients who reported having had headache attacks between sessions, despite their history of no primary headaches. This finding suggests a possible relationship with the HD, which could allow for classification of such attacks as secondary headaches¹⁰.

In conclusion, the high frequency of headache during the HD sessions and the low number of studies on this frequent problem substantiate the need for further re-

search. Ultimately, it could allow for more precise diagnostic criteria, better understanding of HDH pathophysiology and, finally, leading to a discussion of possible prophylactic treatments.

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