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RESEARCH ARTICLE

BURN, EPILEPSY AND COVID-19

Dehhaze Adil[1], Daghouri Nada-Imane[2], Labbaci Rim[2], Taybi Otmane[2], Diher Issam[2] and Ahmar-Rass Nour El Imane[2]

1. Assistant Professor and Head of the Department of Plastic, Reconstructive and Aesthetic Surgery, Center for Burned Patients, CHU Tangier-Tetouan-Al Hoceima, Morocco.
2. Resident, Department of Plastic, Reconstructive and Aesthetic Surgery, Center for Burned Patients, CHU Tangier-Tetouan-Al Hoceima, Morocco.

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Abstract

The COVID-19 pandemic is a major public health problem. It is not only a health crisis of planetary scope but also a socio-economic crisis with serious consequences. Among the dramatic repercussions in our country was the condemnation of several health structures, including ours. We report the case of a young epileptic woman who suffered a thermal burn by scalding, causing her to suffer from 3rd-degree lesions.Her treatment was delayed because of the sanitary conditions preventing an excision with a skin graft, which led us to follow this patient in directed healing. Therapeutic management in the context of an epilepsy-burn association must be multidisciplinary and adequate, hence the interest of prevention based on patient education, good compliance with treatment, and correct management of the environment.

Introduction:-

Epilepsy is one of the most common chronic non-infectious neurological conditions in the world, and patients with epilepsy should be encouraged to live a normal life. Some epilepsy patients pose a threat to themselves and others during seizures because epilepsy is a serious condition with high morbidity related to associated trauma such as head injury, fractures, drowning, and burns, especially since these seizures occur without any warning, leading to loss of consciousness and seizures. Therefore, the relationship between epilepsy and burns is obvious, especially if the attack takes place in the proximity of culminating agents.

In this context, we report the case of an epileptic patient victim of a thermal burn leading to 3rd-degree lesions during an attack crisis, whose treatment was delayed due to the Covid-19 health circumstances and the difficulty of access to care.

Case Presentation

This is a 47-year-old patient with a history of idiopathic epilepsy for 20 years who was on dual therapy: valproic acid 500mg/d + Carbamazepine 300mg / d, admitted to the emergency room at H4 after thermal burn by scalding (cooking oil) during an epileptic seizure.

Corresponding Author:- Dr. Dehhaze Adil
Address**:-** Department of Plastic, Reconstructive and Aesthetic Surgery, Center for Burned Patients, CHU Tangier-Tetouan-Al Hoceima, Rabat road Km 17 BP 398 Gzinaya ,Tangier, Morocco.

In General: On admission, the patient was hemodynamically stable (BP=13/08, HR=80batt/min), neurologically stable (patient conscious with GCS 15/15), and respiratory stable (FR=25cycles/min).
Locally: (Table1) (Figure1)

Table 1:- Characteristics of burn injuries.

Burned skin surface	1%	
Depth of involvement	3rd-degree burn	
Topography	Dorsal face of the right hand	Distal phalange of the 1st finger Distal and intermediate phalanges of the 2nd finger Distal and intermediate phalanges taking the interphalangeal joint proximal of the 3rd and 4th finger The proximal interphalangeal joint of the 5th finger
	Palmar surface of the right hand	Distal and proximal phalanges of the 1st finger Thenar eminence Distal, middle, and proximal phalanges of the 2nd finger Distal phalanges of the 3rd, 4th, and 5th finger

Figure 1:- The appearance of lesions on admission.

Therapeutically: The patient benefited from washing with a dressing based on silver sulfadiazine, fatty tulles and sterile compresses, a level I analgesia; Paracetamol, tetanus serum, and a neurological opinion whose decision was to increase the dose of carbamazepine to 600mg/d instead of 300mg/d. (Figure2)

Figure 2:- The appearance of lesions after washing with 0.9% SS.

Evolution: The evolution was marked by the installation of distal necrosis motivating the realization of a necrosectomy in the operating room under general anesthesia postponed several times because of the pandemic situation Covid-19 which limited the operative days. (Figure3)

Figure 3:- Distal necrosis.

Necrosectomy could be performed 40 days later, allowing complete removal of all infected necrotic tissues to improve the healing potential of healthy tissues with the use of a dressing based on fusidic acid, fatty tulles, wet compresses soaked in saline, and dry compresses. (Figure4, 5,6)

Figure 4:- Dorsal side after necrosectomy.

Figure 5:- Palmar surface after Necrosectomy.

Figure 6:- Necrotic Debris.

A skin graft was planned for the patient as a second step after ensuring the two necessary conditions for graft, which are a good quality subsoil and the absence of bare noble elements, but given the worsening of the pandemic situation Covid-19 and the impossibility of access to the operating room in these circumstances, the decision was to follow the patient in consultation and to lead her in directed healing until the resumption of the surgical activity.

During the first postoperative consultation, we opted for a dressing based on an anti-inflammatory topical on the 2nd finger and a lipid-colloid tulle on the 3rd finger with an appointment in 07 days but the sanitary conditions worsened in our country condemning several health structures including ours over a period of 02 months. The patient who was lost from sight presented herself after the resumption of the activity with complete healing of the lesions. (Figure7,8)

Figure 7:- Hand condition 10 days postoperatively.

Figure 8:- Appearance of the hand after complete Healing.

Discussion:-

Patients with epilepsy may experience severe burns during acute episodes. These patients must be identified, given specific treatment, and educated to avoid an unpredictable seizure that can result in dramatic deep burns and lead to more difficult management and, consequently, higher costs, increased morbidity, and even mortality.

Various authors report that the incidence of burns in epileptic patients can represent 5% in a study conducted by Bull et al[1] and 10% according to Meirelles et al[2], of the total admissions in a burn unit.

In our case, the epileptic burn patient was young (47 years old), which is consistent with some studies reported in the literature; the average age above 30 years being reported by most series[3][4][5] and age around 20 years according to Jowdar[6]. According to the latter author[6], women represented two-thirds of the epileptic burn patients and in the study carried out by Adigun et al[7], the two epileptic patients who suffered burns while cooking were women. This coincides with the findings of Meirelles et al[8], who noted that a large number of patients had visual contact with the flame before the accident, suggesting that fire could be a photostimulation for the onset of an epileptic seizure, a result that is consistent with our case because our patient had visual contact with a flame in the kitchen at the time of the accident. For Jowdar[6], the confined and hot atmosphere of kitchens would also be a factor favoring the triggering of a seizure. Napoli et al[9] reviewed the medical records of 14 patients burned because of an epileptic seizure. They concluded that epileptic seizures are an important predisposing factor for burns; the burning agent emits light stimuli that trigger the onset of epileptic seizures and can affect important areas, including the face and hand. This leads us to strengthen our prevention efforts with young women.

The most important risk factors justifying the increased incidence of burns in patients with epilepsy are frequency of seizures, duration of the epileptic episode[10][11], and lack of awareness and education about the risk of burns in these patients[8]. Other risk factors can be incriminated which are the socio-economic characteristics namely patients from rural areas and epileptics from the economically weak population[6].

Josty et al[12] performed a retrospective study of 111 patients admitted with burns secondary to an epileptic seizure. They concluded that thermal scald burns are the main cause of burns in epileptic patients. This is consistent with the findings in our case, where the patient suffered a scald burn; however, scald burns from cooking fluids were the main mechanism identified in several studies [4][9][13][14][15].

The topography of the burns is correlated according to the mechanism: in case of hot liquid release, the lower limbs are the most affected, whereas, in case of flame burns, the lesions concern the cephalic extremity. Whatever the etiology, the burn is not very extensive, not exceeding 20% of the body surface area in the majority of studies [4][11][14], but is deeper in these patients, mostly in the second and/or third degree. This can be explained by the associated loss of consciousness and the absence of withdrawal reflexes during contact with heat sources, increasing the contact time and not allowing rapid cooling of the lesions.

A deep burn involves more skin components, which prevents rapid healing and scarring of the skin. Surgical interventions are necessary for deep dermal burns to accelerate healing and reduce scarring. This can be achieved by excision of the burn and skin grafting of varying thickness in most cases[9]. This surgical intervention represents the gold standard treatment of a severe burn in the acute phase[6]. In the Brosset study, dermal-epidermal graft excision was necessary for all patients [14]. In a Tunisian study, 16/20 of the patients required excision of necrotic tissue, and a dermo-epidermal graft was performed only in 2 patients, given the severity and instability of some patients, and the limitation of donor areas given the extent of the burns [13]. In our case, the patient could not benefit from an early excision graft because of the sanitary conditions and the inability to access the operating room in the acute phase.

Burns occurring during an epileptic seizure is serious, providing heavy functional and aesthetic sequelae. In a Tunisian study, 25% of patients had an amputation [13], a result comparable to that published in an Algerian series by Jowdar (24%) [6]. Adigun et al [7] studied "Amputation of a burn following an epileptic seizure" in their burn unit. A total of 250 patients were managed during the study period of 5 years. Two patients met the inclusion criteria. In the light of our case and the review of the literature, it appears that the risk of amputation is not nil but on the contrary, it is a fairly frequent intervention in the context of burns in epileptics.

Burns occurring during an epileptic seizure is serious and sometimes leads to high mortality. In a Tunisian study[13], mortality was 25% secondary to refractory shock. Agbenorku et al. reported a death rate of 9.5%, which is lower than the overall mortality rate in their burn unit, which is 24.2% [4].

Therapeutically, the management should not only aim at treating the burn lesions but also at balancing epilepsy. For this, it will be necessary to establish an effective drug treatment in case of inaugural disease. If the epilepsy is known, it will be necessary to adjust the previous treatments, to establish rigorous modalities of surveillance and follow-up [6], and especially to ensure that these patients take their treatment because one of the main problems in patients with epilepsy is their non-compliance [16].

No impact of the burn on the epileptic disease could be demonstrated in our case: we did not find any imbalance of the epileptic disease induced by the burn in our patient. A case of imbalance of the epileptic disease by the burn is reported in the literature: Gragnani et al. report the case of a 36-year-old woman, known to be epileptic for 12 years, who developed recurrent seizures after an extensive burn, despite the maintenance of her anticonvulsant treatment[17].

Burns in epileptics is a lesion that can be avoided thanks to preventive measures that constitute the basis of any management. The literature proposes several preventive protocols to avoid recurrent epileptic seizures and therefore burns [18]: Patient and caregiver education for better cooperation. Regular intake of anti-seizure medication, as good compliance is the first preventive measure. Regular monthly follow-up of the patients in consultation for good control of the seizures, carried out by the same doctor remains essential. The understanding of the circumstances of occurrence of these burns during epileptic seizures allows considering simple prevention strategies based essentially on the avoidance of risky cooking activities during periods of therapeutic adaptation or imbalance [19], avoidance of leaving an epileptic alone near a heat source, and use of microwave ovens, self-closing fryers, and insulated plastic kettles [9][20]. Other recommendations that may decrease the incidence of burns in epilepsy patients have been suggested by other authors: use of firewalls and heaters, flame retardant clothing, and adherence to showering advice [21][22][23]. Audio-visual awareness and/or awareness campaigns during health caravans could also be of great help to epilepsy patients.

Conclusion:-

Patients with epilepsy should be classified in the high-risk group because of the severity of burns in these patients, which can be life-threatening and often cause dramatic aesthetic and functional complications.

Management must be adequate and multidisciplinary. The difficulty of this problem makes the prevention of burns all the more interesting, as it involves educating the patient to comply with the anticonvulsant treatment, regular follow-up, and the development of the patient's environment.

References:-

1. JP Bull, DM Jackson, and C Walton, "Causes and prevention of domestic burning accidents," Rr Med, vol. 2, pp. 1421-7, 1964.
2. DO Maisels, "Corps BVM: Burned epileptics," Lancet, vol. 1, pp. 1298-1301, 1964.
3. MS Akhtar, I Ahmad, AH Khan, and Coll, "Burn injury in epileptic patients: an experience in a tertiary institute," Ann Burns Fire Disasters, vol. 27, pp. 9-126, 2014.
4. P Agbenorku, A RA Bukari, A T Effah, and Coll, "Burn injury in epileptics: the trend and risk factors in the middle belt of Ghana," Burns Open, vol. 2, pp. 122-5, 2018.
5. MM Al-Qattan, "Burns in epileptics in Saudi Arabia," Burns, vol. 26, pp. 561-3, 2000.
6. S Jowdar, R Kismoune, F Boudjemia, R Bacha, and M Abchich, "brulure et epilepsie - etude sur une decennie 1984-1994," Annals of Burns and Fire Disasters, vol. IX, no. 2, 1996.
7. IA Adigun, KO Ogundipe, and QQ Abiola, "Amputation from burn following epileptic seizure," Surgey Journal, vol. 3, pp. 78-81, 2008.
8. PRC Meirelles, NP Piccolo, and PP Piccolo, "Epileptic burn patient's profile: Prospective and retrospective study of epileptic patients admitted at pronto scorropara Oueimaduras, Goiania, Brazil," Burns, vol. 33, pp. 102-3, 2007.
9. B Napoli, N D'Arpa, and M Masellis, "Masellis M: Epilepsy and burns," Annals of the MBC, vol. 5, pp. 155-9, 1992.

10. EH Richards, "Aspects of epilepsy and burns," Epilepsia, vol. 9, pp. 35-127, 1968.
11. MC Spitz, JA Towbin, and D Shantz, "Towbin JA, Shantz D et al.: Risk factors for burns as a consequence of seizures in persons with epilepsy," Epilepsia, pp. 7-764, 1994.
12. IC Josty, V Narayanan, and WA Dickson, "Burns in patients with epilepsy: Changes in epidemiology and implications for burn treatment and prevention," Epilepsia, vol. 41, pp. 6-453, 2000.
13. E wirrell, "Epilepsy-related injuries," Epilepsia, vol. 47, no. 1, pp. 79-86, 2006.
14. NN Lam, NM Duc, and L Nam, "Epilepsy related burn injuries in a developing country: an experience in National Burn Hospital," Burns Open, vol. 3, pp. 99-102, 2019.
15. A Ibrahim and ME Asuku, "Burns of the face in epilepsy: risk factors and an opportunity for prevention," African Journal of Trauma, vol. 3, no. 87, 2014.
16. D Buck, A Jacoby, GA Baker, and DW Chadwick, "Factors influencing compliance with antiepileptic drug regimes," Seizure, vol. 6, pp. 87-93, 1997.
17. A Gragnani, BR Muller, AF Oliveira, and LM Ferreira, "Burns and epilepsy—review and case report," Burns, vol. 41, pp. 15-18, 2015.
18. A Watts, "A model for managing epilepsy in a rural community in Africa," Br Med, vol. 298, no. 805, 1989.
19. Y K Minn, "Who burned and how to prevent? Identification of risk for and prevention of burns among epileptic patients," Burns, vol. 33, pp. 8-127, 2007.
20. KK Hampton, RC Peatfield, and T Pullar, "Burns because of epilepsy," BMJ, vol. 296, pp. 60-1959, 1988.
21. MN Tempest, "A survey of domestic burns and scalds in Wales during 1955," Br Med J, vol. 1, pp. 1387-92, 1955.
22. JP Bull, DM Jackson, and C Walton, "Causes and prevention of domestic burning accidents," Rr Med J, vol. 2, pp. 1421-7, 1964.
23. S Livingston, LL Pauli, and I Pruce, "Kramer II: Bathing instructions for patients with epilepsy," JAMA, vol. 245, pp. 702-3, 1981.