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CAN HAPE BE DIAGNOSED THROUGH THE TONGUE?

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ABSTRACT

High Altitude Pulmonary Edema (HAPE) is an acute illness with dramatic manifestations in the lung that also affects all systems of the body. Hence, very careful observations are required to discover all of these manifestations.

It is our observation that patients with HAPE frequently have ulcers on the tongue. The tongue appears white with one or more reddish colored ulcers that have rough irregular borders. It is non painful and without bleeding. The alterations of the mucosa of the tongue appear similar to geographic tongue. It seems to be related to the severity of the HAPE, and disappears rapidly with oxygen treatment of the pulmonary edema.

Over the past two years, we have seen 6 cases of HAPE of whom 4 presented with tongue ulcers. The other two cases' tongues were pale white and could have formed ulcers had they not received oxygen therapy. The origin of the ulcers is unknown, although it has been hypothesized to be manifestation of viral infection, associated to peripheral vasoconstriction, and/or dehydration.**(Acta Andina 1996, 5:31-34)**

RESUMEN

El Edema Agudo Pulmonar de Altura (HAPE) es una enfermedad con dramáticas manifestaciones en el pulmón, que también afecta a otros sistemas. Por lo tanto, se requieren observaciones cuidadosas para descubrir estas manifestaciones. Hemos observado que los pacientes con HAPE frecuentemente tienen ulceras en la lengua. La lengua se presenta blanca con una o más ulceras rosadas de bordes irregulares. No existe dolor ni sangrado. Estas alteraciones de la mucosa de la lengua son semejantes a la lengua geográfica. Parecen estar relacionados a la gravedad del HAPE, y desaparecen rápidamente con la oxígeno-terapia del edema pulmonar.

En los últimos 2 años, se ha observado 6 casos con HAPE, de los cuales 4 presentaban ulceras en la lengua. Los otros 2 casos, tenían lenguas blancas y es posible que si no hubieran recibido tratamiento, las úlceras se hubieran manifestado. El origen de estas úlceras es desconocido, a pesar que se ha hipotetizado que es una manifestación de infección viral asociada a vasoconstricción periferica y/o deshidratación. **(Acta Andina 1996, 5:31-34)**

High Altitude Pulmonary Edema (HAPE) is a well known illness that can occur on rapid ascent to high altitude [1,3,6,7]. The pulmonary manifestations are evident during auscultation with the presence of rhonchi, rales accompanied by pink sputum and a history of progressive dyspnea over a period of one to four days after rapid ascent to 2500-3000 m [1]. The hemodynamic characteristics have been amply studied [11,4] and responses of the autonomic nervous system in HAPE have been reviewed [9].

To our knowledge, examination of the tongue in this condition has not been described elsewhere. We present two cases with photographs to illustrate this observation.

Cases

In the course of routine treatment of HAPE in a 12 year old boy who had arrived to La Paz, Bolivia (3500 m) the previous day after spending 15 days of vacation at sea level, we observed the previously described symptoms of HAPE. The diagnosis was confirmed by chest x-rays, with typical opacities of a patchy distribution of edema in both lungs. On physical examination the tongue appeared white with two ulcers on the left side. (Fig. 1). One was about 8 mm in diameter, medially located with rough borders, a pink base, non hemorrhagic and non painful to the touch. The second ulcer was 3 mm in diameter laterally located with the same appearance as described above.

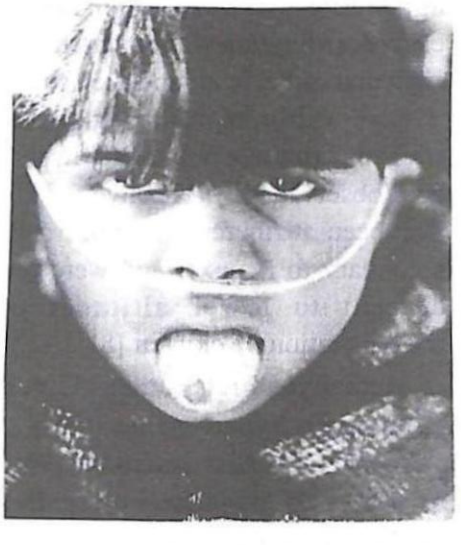

Figure 1.-Photograph of the tongue showing two ulcers in a patient with HAPE.

The second case was that of a 43 year old man, native to sea level who came to the city of La Paz (3500 m), and presented with radiographically diagnosed HAPE that was treated with oxygen. He presented with several ulcers on the tongue

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as shown in Fig 2. This case was more severe clinically.

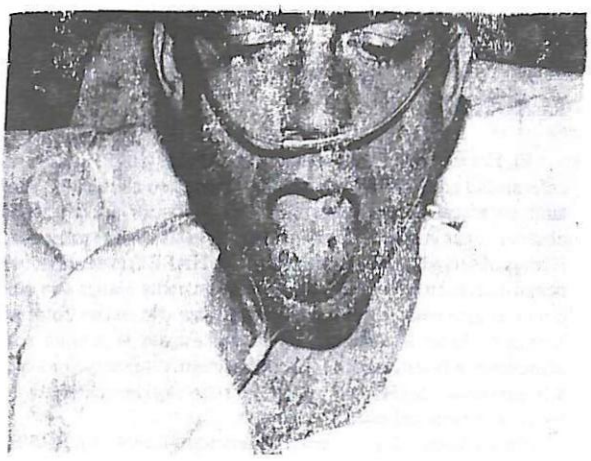

Figure 2.- Photograph of the tongue showing multiple ulcers in another patient with HAPE.

Discussion

The symptoms of HAPE include: headache, nausea, anorexia, insomnia, cough, dyspnea and production of pink frothy sputum. The physical findings included diffusely located rales that may acquire an asymetrical pattern, tachycardia, tachypnea, mild fever and cyanosis. Laboratory analysis finds a mild leukocytosis in some cases. Hematocrit and hemoglobin may be normal or increased. Chest x-rays show opacities of a patchy distribution, occasionally appearing in only one lung [6]. The electrocardiogram with inverted T waves in the right precordial leads and a left shift in the mean T wave vector representing right ventricular strain due to acute pulmonary hypertension has been observed [10]. The inverted T waves have also been attributed to myocardial ischaemia secondary to hypoxia and were reversible on descent to lower altitudes or by the administration of oxygen [8].

Hemodynamic studies [2,4,10], show pulmonary hypertension (PH), increased pulmonary vascular resistance (PVR), normal or decreased pulmonary capillary pressure (PCP); and a markedly decreased arterial oxygen saturation (O_2 Sat), not initially corrected with 100% oxygen. Pathologically, fibrin deposits have been found at autopsy within the alveoli and small capillaries, along with focal interstitial myocarditis [5]. There also may be focal inflammatory in the myocardium.

Since our original description of tongue ulcers with [12], we have been surprised to find these ulcers in HAPE frequently.

Treatment of the pulmonary edema is accompanied by the disappearance of the tongue ulcers in one or two days. These lesions should be looked for when observing a patient under suspicion of having HAPE. If present they may aid in the diagnosis, particularly for non-medical mountain climbers.

It has been hypothesized that due to their clinical similarity to herpes lesions in the mouth, the origin of these ulcers may be due to a viral infection.

As an aside, we have observed that if oxygen treatment is interrupted while capillary blood samples are being drawn from the earlobe of patients with HAPE, the bleeding stops, but is easily resumed if oxygen treatment is reinstated. This may be explained by peripheral vasoconstriction in the earlobe during hypoxia, however further investigation is required.

We speculate if vasoconstriction can partially affect areas of the mucosa of the tongue, producing the ulcers. The highly vascularized mucosa of the tongue is also very sensitive to fever, diet irregularities and dehydration among other things. Further studies are necessary to define the pathogenesis of ulcers on the tongue associated with HAPE.

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References

1.-Coudert J. (1985) High-altitude pulmonary edema. Medicine Sport Sci.; 19: 99-102.

2.-Fred H.L., Schmidt A.M., Bates T. & Hecht H.H. (1962) Acute pulmonary edema of altitude. Circulation.; 25: 929-937.

3.-Houston C.S.(1960) Acute pulmonary edema of high altitude. N Engl J Med.; 263: 478-480.

4.-Hultgren H.N., Lopez C.E. & Lundberg E. (1964) Physiologic studies of pulmonary edema at high altitude. Circulation.; 29:393-408.

5.-Hultgren H.N., Spickard W. & Lopez C.(1962) Further studies of high altitude pulmonary edema. Br Heart J.; 24: 95-102.

6.-Hultgren H.N., Spickard W.B., Heliriegel K. & Houston C.S.(1961) High altitude pulmonary edema. Medicine.; 40: 289-313.

7.-Hurtado A.(1937) Aspectos fisiologicos y patologicos de la vida en la altura. Imp. Editorial Runae S.A. Lima, Peru.;: 30.

8.-Marticorena E., Severino J., Peñaloza D., & Sime F.(1981) Ondas t de hipoxia en el individuo desadaptado a las grandes alturas. Programa y abstractos. Primer Congreso Nacional de Medicina de la Altura. La Oroya, Peru.

9.-Mathew,L.,Purkayastha, S.S.,Jayashakar,A., Radhakrishnan U.,Sen Gupta, J.Nayar H.S. (1985) Responses of the autonomic nervous system in altitude adapted and high altitude pulmonary oedema subjects. Int. J.Biometeor.; 29: 131-143.

10.-Peñaloza D.(1978) Edema pulmonar agudo por ascencion a la altura; hemodinamica. Primeras Jornadas de Med y Cir de altura. La oroya,Peru.

11.-Sujoy, B.R., Guleria, J.S.,Khanna, P.K., Manchanda, S.C., Pande J.N. & Subba P.S. (1969) Haemodynamic Studies in High Altitude Pulmonary Oedema. Br. Heart J.; 31: 52-58.

12.-Zubieta-Calleja G.R. & Zubieta-Castillo G.(1989) High altitude pathology at 12000 ft. Imprenta publicidad Papiro, La Paz, Bolivia.