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ORIGINAL ARTICLE

Ease of use, feasibility and performance of ankle arm index measurement in patients with chronic leg ulcers: Study of 100 consecutive patients

Mesure de l'index de pression artérielle systolique à la cheville chez un patient porteur d'un ulcère de jambe. Faisabilité et performance chez 100 patients consécutifs hospitalisés dans un service spécialisé

I. Lazareth*, J.C. Taieb, U. Michon-Pasturel, P. Priollet

Service de médecine vasculaire, groupe hospitalier Paris Saint-Joseph, 185, rue R.-Losserand, Paris 75014, France

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Summary International guidelines on leg ulcers recommend measuring the ankle arm index (AAI) to diagnose and assess peripheral arterial occlusive disease (PAOD) of the lower limbs. These guidelines do not, however, describe the method which should be used to make the measurement: which artery should be measured — in the event of an open leg ulcer, what are the practical difficulties for positioning the cuff — how well do patients tolerate the procedure? We conducted a prospective study focusing on ease of use, tolerance and performance of AAI measurements in patients with leg ulcers. In compliance with recent French guidelines, we measured the AAI for both distal leg arteries and retained the lowest value for analysis. Within a six-month study period, 100 consecutive inpatients with leg ulcers of various etiologies were studied. Mean age was 75, female predominance 60%, body mass index 27. Etiologies of leg ulcers were pure venous (29%), mixed venous predominant (17%), pure arterial (9%), mixed arterial predominant (8%), mixed (6%), hypertensive ulcers (11%), rare cause (8%), multifactorial (12%). Pain was present in 92%, with a VAS above 3 for 73%. Measurement of AAI was possible in 98% of patients. It was too painful and thus considered unethical for two patients with hypertensive ulcers. For the 98 patients measured, the ulcer had to be protected during the measurement in 76%. The measurement procedure only took five minutes for one leg, and was judged easy to perform by 93% of the operators. For the majority (76%) of patients, the measurement was not painful. We determined the diagnostic performance of AAI by comparing

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* Corresponding author.
E-mail address: ic.lazareth@wanadoo.fr (I. Lazareth).

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the results with those of arterial ultrasound in 90 patients who had a complete arterial ultrasound exploration of the legs. Compared with arterial ultrasound, the sensitivity of AAI < 0.9 for detecting the presence of PAOD was 84.7%, with 97% specificity. PAOD was not diagnosed in any patient who had two palpable distal pulses and a normal AAI. Measurement of AAI in patients with leg ulcers is an easy to use, well-tolerated, high-performance tool for the assessment of PAOD.

MOTS CLÉS
Ulcères de jambe ;
Angiodermite nécrotique ;
Index de pressions systoliques distales ;
Artériopathie oblitérante des membres inférieurs

Résumé La Haute Autorité de santé (HAS) a recommandé en novembre 2006 de mesurer l'index systolique des pressions distales (IPS) chez tout patient porteur d'un ulcère de jambe. Cette recommandation peut sembler difficile à appliquer chez ces patients (douleurs, présence de l'ulcère empêchant le positionnement du brassard). Le but de cette étude a été d'évaluer la faisabilité, la tolérance et la performance de l'IPS chez des patients non triés hospitalisés pour un ulcère de jambe. Cent patients consécutifs ont été étudiés, de moyenne d'âge 75 ans, sexe ratio féminin 60 %, d'index de masse corporelle moyen 27. Les ulcères mesuraient plus de 10 cm^2 et s'accompagnaient d'un écoulement dans les 2/3 des cas. Les étiologies étaient très diverses : veineux purs 29 %, mixtes 31 %, artériels purs 9 %, angiodermites nécrotiques 11 %, ulcères de causes rares 8 %, ulcères multifactoriels 12 %. Les ulcères étaient douloureux pour 92 % des patients, supérieurs à 3 sur l'échelle visuelle analogique pour 73 % des patients. La mesure de l'IPS a été possible pour 98 patients. Pour deux patients ayant une angiodermite nécrotique, le gonflage du brassard était trop douloureux pour pouvoir réaliser la mesure. Le geste a été jugé facile dans 93 % des cas et n'a pris en moyenne que cinq minutes pour la jambe étudiée. Il a été jugé comme peu ou pas douloureux par 76 % des patients. Quatre-vingt-dix patients sur 98 étudiés ont eu un écho-doppler artériel complet des membres inférieurs. Comparé à l'écho-doppler artériel, un IPS inférieur à 0,9 a une sensibilité de 84,7 % et une spécificité de 97 % pour dépister une artériopathie des membres inférieurs. Aucun patient qui avait les pouls distaux présents à la palpation et un IPS normal n'avait d'artériopathie. La recommandation de la HAS pour mesurer l'IPS chez tout patient porteur d'un ulcère de jambe est une recommandation facile à mettre en œuvre et qui, associée à la palpation des pouls, permet de diagnostiquer de façon fiable l'artériopathie des membres inférieurs chez ces patients.

Introduction

Leg ulcer is a common condition with an estimated overall prevalence of 0.63% [1], 3% for persons aged over 80 years [2].

A vascular mechanism is involved in 90% of cases. Venous disorders predominate among the vascular causes, accounting for 70% of patients. But 30% of the vascular causes result from peripheral arterial occlusive disease (PAOD) of the lower limbs, either exclusively in which case the ulcers are termed arterial, or associated with venous disease, in which case the term mixed ulcers is used. The prevalence of PAOD of the lower limbs increases with age; it is estimated to affect 50% of patients aged over 80 years with a leg ulcer [3].

Screening for PAOD in patients with leg ulcers is highly recommended both by international guidelines concerning leg ulcers [4—6] and the French national guidelines proposed in November 2006 by the Superior health authority (*Haute Autorité de santé* [HAS]) [7]. The HAS conducted a systematic review of the literature to establish a level-of-proof report concerning management practices for pure venous or mixed predominantly venous leg ulcers. That report stated that screening for PAOD of the lower limbs is clinical, requiring palpation of the distal pulses and measurement of the ankle-arm index (AAI). Since the specificity of pulse palpation to identify underlying PAOD of the lower limbs is 90% if the two distal pulses are not perceived, search for the distal pulses should be performed systematically. Inversely, the presence of both peripheral pulses cannot rule out PAOD of the lower limbs (sensitivity < 75%) [8]. In addition, palpation of the pulses can be hindered in patients with a leg ulcer and distal edema, sclerotic skin, or an ulcer situated in the zone of palpation.

The HAS statement strongly recommends measuring the AAI in all patients with a leg ulcer; this recommendation is one of the key points. It is recommended to measure the AAI for the anterior and posterior arteries, to retain the lower value, and to define PAOD of the lower limbs as AAI < 0.9.

The HAS emphasizes two key reasons for measuring the AAI:

- diagnosis of underlying PAOD of the lower limbs which could explain or aggravate the ulceration (level 2). Establishing the diagnosis of PAOD of the lower limbs can also identify a subpopulation of patients with high cardiovascular risk requiring specific management (treatment of cardiovascular risk factors, search for other localizations of PAOD, specific medication to treat the atherosclerosis) (HAS guidelines for PAOD of the lower limbs, 2006) [9];
- adapt compression (professional agreement), depending on the etiology of the ulcer: strong multilayer compression can be proposed for patients with a normal AAI. If the AAI is pathological, a lower level of minimally elastic compression is advisable under medical surveillance.