Opinoin

Therapeutic education patient in prevention of diabetic foot: a neglected opportunity

Summary

One important complication of diabetes is foot problems. The diabetes foot is one of the most important reasons leading to amputation. It has been estimated that up to 25% of type 2 diabetes patients may develop diabetic foot ulcer once in their lifetime. Foot lesions constitute an increasing public health problem and also have substantial economic consequences. Diabetic foot ulcers can be prevented and the incidence of ulceration may be reduced through targeted and continuous education on the patient (and/or caregivers) and the early treatment of risk factors. The professionals involved in these activities, make up the multidisciplinary team, which is composed of medical specialists (diabetologist, internist, orthopedic, vascular surgeon, radiologist, cardiologist, etc) and prepared and trained professionals, such as nurses and podiatrists. The two RCTs and three non-controlled studies on the effect of patient education do not provide evidence to support a single session of patient education for foot ulcer prevention. Patient education can have many forms, with different methods (e.g. individual or group sessions), different intervals (e.g. single session or weekly meetings), and different educators (e.g. nurses, podiatrists and doctors). The best solution for patient education to be beneficial in prevention may yet have to be investigated. More evidence from well designed studies is needed on this topic. These studies should investigate different forms of patient education and find the most effective methods to promote the correction of habits and wrong attitudes.

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Opinion

It is estimated that by 2040 there will be over 642 million people with diabetes in the world and 80% of these people will live in developing countries.[1] The diabetic foot syndrome are a source of high impact for the patients and societal cost. The frequency and severity of foot problems varies from region to region, due to differences in diabetes incidence and treatment, socio-economic conditions, use of protective shoes, and standards of foot care. Foot wounds are the most prevalent problem, with a yearly incidence of around 2–4% in developed countries.[2] With the lifetime incidence of foot ulcers occurring in up to 25% of patients,[3] we need to shift our focus to prevent ulcers rather than to treat them. In developed countries, diabetes is the most responsible of non-traumatic amputation; about in 1% of people with diabetes occur a lower-limb amputation.[4,5]

Diabetes is not the only cause of ulceration. Risk factors for the development of foot ulcers are peripheral sensor neuropathy, foot deformities related to motor neuropathy , minor trauma, high plantar foot pressures, peripheral artery disease, previous ulceration or amputation and visual impairment.[6,7]

While only two-thirds of diabetic foot wounds heal,[6,7] over 28% of lesions lead to a lower extremity amputation.[8] Data from amputation estimated that every 20 seconds a lower limb is lost to diabetes somewhere in the world.[2] Diabetic foot disease is associated with impaired quality of life.[9,10] and high mortality. After primary ulceration,[11] 5% of diabetic patients die within the first year after the onset of the lesion, 42% die within 5 years. 5-year mortality rates after amputation is dramatic, it is estimated to be 68–79%,[10,15] second only to lung cancer.[16]

In the International Working Group on the Diabetic Foot (IWGDF) Guidance 2015,[17] there are five key elements that underpin prevention of foot problems: 1- identification of the at-risk foot; 2- regular inspection and examination of the at-risk foot; 3-education of patient, family and healthcare providers; 4- routine wearing of appropriate footwear; and 5- treatment of pre-ulcerative signs.

Education of patient, family and healthcare providers about foot care is an important cornerstone of prevention of foot problems.[17] Therapeutic patient education (TPE) has been defined by the WHO.[18] As an instrument that helps patients to acquire or maintain the knowledge and competence they need to manage as well as possible their lives with a chronic disease. TPE is a fundamental step in patient care that need to be often refreshed and internalize by the patient. It comprises various and organized activities, starting to psychosocial support, performed to obtain consciousness, to inform patients about their disease. Patients have to know their health care setting, modality of hospital organization and procedures, behavior related to health and disease. Consciousness and information permit to patient with foot lesions and their families to understand kind of disease and their treatments, and to obtain collaboration with each other and take responsibility for their own care. The final objective is to maintain or to improve their quality of life. Education performed in a structured and organized manner, plays a pivotal role in the prevention and treatment of foot problems.

People with diabetes should know how to prevent potential foot problems, recognize early presentation without losing time before referral to doctors. They have to learn the correct steps they need to take when problems arise. Prevention cannot be separated from an active collaboration with the patient. Becoming a main actor in the management of one's own illness is one of the most complex and important aim of therapeutic education. Patients with diabetes should be educated to foot care, risk factor for lesions and behavior to avoid. When a diabetic patient presented an high-risk foot conditions,

he should be able to recognize possible complications and learn appropriate management Patients at risk should understand the relationship between glycemic control, lifestyle and foot problems,[19] implications of the loss of protective sensation. For neuropathic patients is fundamental the daily foot monitoring, an adequate care of the foot that include nail and skin care, and the choice of appropriate footwear. Shoes represent one of the most important element for lesions development in particular in presence of inside stitching or for a shape not corresponding with the foot. Moreover foreign body could be present inside and causes conflict. Patients should be advised to use new shoes gradually to minimize the formation of blisters and ulcers. Health care team has to assess not only patient's understanding of these concepts but also test physical ability to conduct proper foot surveillance and care. Blind patients or with some visual impairment, physical constraints preventing movement, or cognitive problems that alterate their ability to assess the condition of the foot and to institute appropriate responses will need other people, such as family members, to assist in their care. Patients at low risk may benefit from education on foot care and footwear too.[20,21]

The program of an educational intervention requires the design and implementation of appropriate assessment tools that can assess the skills, abilities and performance of the subjects studied. Practical demonstration of some skills like cut nails or calluses treatment should showed to patients. The educational program needs to provide several education sessions over time, to use a mixture of methods (e.g. individual or group sessions), different intervals (e.g. single session or weekly meetings). Presence of different educators, nurses, podiatrists or doctors, can improve the effectiveness. During educational treatment it is essential to evaluate whether the person with diabetes or close family member has understood the messages and has sufficient self-care skills. Motivation and adherence to program present a pivotal role in lesions prevention. It is important to develop adult learning strategies that take both literacy.[22] and health beliefs of patients into consideration because these are often quite different from those of medical personnel.[23]

Questionnaires can support the evaluation of an educational intervention and help the educator to understand if a person has understood the messages.[24,25]

Furthermore, it is important to improve healthcare professionals skills, giving specific instructions to educate patients at risk for foot ulceration.[17]

Several review articles on the diabetic foot, which include education among the prevention strategies discussed, have been published. In systematic review, Dorresteijn et al.,[26] demonstrated that only 5 of the 12 randomized controlled trials report the effects of therapeutic education on primary endpoints. In a randomized trial by Malone et al.[27] a 1-hour group educational program reduced the incidence of amputation and new ulcerations in diabetic patients with foot infection, ulcer or prior amputation referred for podiatry or vascular surgery. Though interesting, the results of that trial cannot easily extended to patient with a lower risk profile. Lincoln et al.,[28] in an RCT with low risk of bias, test the effect of a single education session in preventing ulcer recurrence. They analyze 172 people with diabetes, all patients received a single 1-h education session, followed by a single phone call after 4 weeks, in addition to standard care. This treatment did not significantly improve ulcer recurrence at 12 months compared with standard care alone: 41.4% vs 41.2%. Effects of education in the short term were analized in other trials, the results seem to underline the positive effect of foot care knowledge and self-reported patient behavior. Yet, based on the only two sufficiently powered studies reporting the effect of patient education on primary end points, the authors,[26] conclude that there is insufficient robust evidence that limited patient education alone is effective in achieving clinically relevant reductions in ulcer and amputation incidence. In another systematic review, Van Netten et al.,[29] found that in two non-controlled studies,[30,31] a decreased in ulcer risk in patients who were adherent to change in behavior after an educational intervention. The author's conclusion was that two RCTs. [30,31] and three non-controlled studies.[28,32.33] on the effect of patient education do not provide evidence to support a single session of patient education for foot ulcer prevention .

In a recent RCT, Monami et al.,[34] demonstrated in 121 patients that a brief 2-hour focused group is effective in preventing diabetic foot ulcers in high-risk patients. In this study, patients were randomized in a 1:1 ratio either to intervention or to control group. The intervention group was a two-hour program provide to groups of 5-7 patients, including a 30 minute face to face lesson on risk factors for foot ulcers, and a 90 minute interactive session with practical exercises on behaviors for reducing risk. The intervention involved a physician (for 15 minutes) and a nurse (for 105 minutes). At randomization, the PIN (Patient Interpretation of Neuropathy) questionnaire was administered to the patients, exploring patient's knowledge about signs and symptoms of neuropathy and risk factors for foot ulcers onset. [27] Patients randomized to control group were supply with brief leaflet with some recommendations for ulcer prevention. During the 6 month follow-up six patients, all in the control group developed ulcers (10% versus 0%, $p<0.012$). Questionnaire score improves significantly after intervention (20 versus 23, $p<0.001$).The main limitations of this study were two. First, the trail was conducted in a single center, performed by highly trained health professionals working in a diabetic foot clinic ; the reproducibility of the program should be verified in different settings . Second, the therapeutic effects of patients education tend to fade with time,[35] the durability of beneficial effects needs to be formally tested in a study with a longer follow-up.

Many studies have shown that a structured therapeutic education patient (TPE) is able to determine a significant improvement in several clinical, lifestyle, and psycho-social outcomes in people suffering from diabetes,[36–38] while there are a few data regarding the potential direct and indirect role that a structured TPE may have in the prevention of diabetic complications.[39–41]

Studies on patient education show that while knowledge of foot problems and foot care behavior can improve, ulcer recurrence is not prevented by limited (i.e. one or two sessions) education.[42] There is no evidence to support a session of patient education for the prevention of a recurrent foot ulcer.[49] Recent data,[34] demonstrated that a brief 2 hour focused group is effective in preventing diabetic foot ulcers in high-risk , as previously reported in another study.[43]

The best setup for patient education to be beneficial in prevention may yet have to be investigated and evidence from well-designed studies is needed on this topic in prevention of diabetic foot. In particular we need studies more high-quality controlled studies that should investigate the cost-effectiveness and different forms of therapeutic education patient.

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Furthermore, many educational interventions focus primarily on improving self-management behavior.[44–47]

Diabetic foot ulceration poses a heavy burden on the patient and the healthcare system, but patient education for prevention of foot ulcer thereof receives little attention . For every euro spent on ulcer prevention, ten are spent on ulcer healing,[48,49] and for every randomized controlled trial conducted on prevention, ten are conducted on healing.[42]

We agree with Bus and van Netten, we need to shift priority in diabetic foot care and research to the prevention of foot ulcers .[42]

About half of the cost of ulcer treatment is spent on hospitalization and amputation treatment.[50] In Geneva, Switzerland, Assal[51] has calculated that the direct cost of nine below-knee amputations equaled the annual salary of a clinical team of three doctors, five nurses, one dietitian, three auxiliary staff, and one secretary. For the same cost, it would be possible to hospitalize 440 patients a year, provide 1500 foot consultations, give 820 h of formal group lectures to patients, 45 roundtable discussions with patients and their families, and 1100h of individual instruction, and allow postgraduate training for 75 health-care providers (nurses and dietitians). Finally, we believe that therapeutic education to be effective requires the personal motivation of all educators, a specific formation and a team approach, a planned and continuously verified organization.

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Conflict of interest

The author declares that there is no conflict interest.

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