

Diabetic foot screening: why is it neglected?

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Abstract

Understanding reasons for the neglect of foot screening during the annual review of people with diabetes enables the development of solutions for this omission. This study explores the reasons within the context of health care delivery systems in terms of the professional, social, political and economic aspects of this screening. Information was obtained through reviewing publications on diabetic foot and health care reform. The omission of annual foot examination for people with diabetes is attributed to the nature of diabetes-related foot problems, people with diabetes, health care professionals and the current structure of health care delivery systems. Increasing the adherence to foot screening for those with diabetes requires short- and long-term strategies. Short- and long-term strategies for reminding patients and staff about foot screening are suggested.

Key words: Annual review • Diabetes • Diabetic foot • Foot screening • Foot ulceration • Health care delivery • Health care reform • Screening

INTRODUCTION

Diabetes is a progressive metabolic syndrome that may predispose people to the development of lifelong conditions, for instance, renal insufficiency, stroke, ischaemic heart disease and diabetic foot disease. Diabetic foot disease is one of the most devastating diabetes-associated morbidities. It is also the most common reason for hospital admission among people with diabetes (1,2) and may lead to the amputation of the lower limb (3,4).

It is well established in the literature that diabetes-related foot problems can be delayed or even prevented through proper control of blood glucose levels (5,6) and foot care (7,8). However, foot screening is not performed for a substantial percentage of the diabetes population (3,9–11). The purpose of this study was to explore the reasons for the neglect of foot screening during the annual review of patients with diabetes. The study begins with an overview of diabetic foot and the complexity of its care. Foot screening is then discussed,

followed by an exploration of the professional, social, political and economic aspects of the neglect of this screening. Finally, suggested solutions are analysed and evaluated.

DIABETIC FOOT

Diabetic foot is an ulcer on the foot, experienced by people with diabetes. Evidence suggests that there is no specific cause for this ulcer (12); however, a correlation has been established between the incidence of diabetic foot ulceration and the presence of factors such as poor glycaemic control (13,14), ageing (15,16), long duration of diabetes (15,16), smoking (13) and poor socio-economic status (17). The available explanation for the development of diabetic foot ulcerations is that people with diabetes are at a greater risk of foot ulcerations because of a combined effect of other diabetes comorbidities. Persons with diabetes are more likely to sustain trauma to their feet because of poor vision, which reduces their ability to avoid sources of injury. However, these people may also develop an injury to their feet with no trauma because of weight-bearing pressure on their feet due to structural changes secondary to diabetes (18). The presence of poor peripheral sensory functions delays the likelihood of discovery of an injury; therefore, the treatment becomes

Key Points

- the purpose of this study was to explore the reasons for the neglect of foot screening during the annual review of patients with diabetes
- evidence suggests that there is no specific cause for a diabetic foot ulcer
- however, a co-relation has been established between the incidence of diabetic foot ulceration and the presence of factors such as poor glycaemic control, aging, long duration of diabetes, smoking and poor socio-economic status

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Key Points

- diabetic foot ulceration is a serious problem
- most hospitalisations among patients with diabetes are related to diabetic foot ulcerations and a large proportion of these patients undergo amputation
- this creates a large financial burden on the community because of overuse of health care services and a decrease in productivity
- prevention is a strategy of choice to reduce the rate of diabetes-related amputations
- the incidence of diabetic foot ulcers is alarming at the global level
- this is perhaps because diabetic foot care is complex and requires the involvement of a wide range of health care professionals in the process of care at the same time which can be challenging

increasingly difficult. This difficulty is coupled with the presence of peripheral vascular disease that reduces blood supply to the foot and is also coupled with a weakness in the immune system. Therefore, a chronic ulcer may develop, and amputation becomes the only option for patients with serious ulcers. In short, diabetic foot ulceration is a serious problem: most hospitalisations among patients with diabetes are related to diabetic foot ulcerations (1,2), and a large proportion of these patients undergo amputation (19). Therefore, a large financial burden is placed on the community because of overuse of health care services and a decrease in productivity. Therefore, prevention is a strategy of choice to reduce the rate of diabetes-related amputations.

The importance of prevention in reducing diabetes-related amputations has been recognised for some time. In 1989, 50 European experts in the field of diabetes, meeting in St Vincent, Italy and under the aegis of the World Health Organisation and the International Diabetes Federation, declared the importance of prevention and cure of diabetes and its complications (20). Five-year targets were set for the improvement of diabetes care; in particular percentages for reducing the consequences of diabetes-related complications were agreed upon. This was set at 50% for diabetes-related lower limb amputations. Six years later, a similar declaration was announced for the Americas (21). In other words, prevention is seen as a strategy that can markedly reduce diabetes-related lower limb amputations. Accordingly, foot care preventive programmes have been initiated in developed and developing countries (22,23).

However, the incidence of diabetic foot ulcers is still alarming at the global level (19,22). The American Diabetes Association claims that 15% of the diabetes population will experience foot ulcers during their lifetime (24). Diabetes-related lower limb amputations are still significant in many countries, with a high possibility of recurrent amputations (25–27). For example, the annual incidence of diabetes-related lower limb amputations in Australia was 2629 for the years 1995–1998 (28). According to a paper published in 2001 by the Chair of the International Working Group on the Diabetic Foot, more than 50 000 of the US diabetes population experience amputations every year (29). Reports from

western European countries have shown that diabetes-related amputations are a significant issue (25–27,30). A more dramatic situation is expected to occur in Asian, African and eastern and southern European countries, despite the lack of data from these countries (22,23). This is because of the global burden of diabetes and its complications (31–33), as well as the concept of foot care in some of these countries being new (22,23), while patients in others have no access to this care (34).

It is extremely unfortunate that diabetic foot ulcers are still a significant problem, despite the early recognition of the seriousness of this issue and the implementation of a wide range of foot care preventive programmes. This situation is perhaps because diabetic foot care is complex and requires the involvement of a wide range of health care professionals in the process of care at the same time, where the coordination of such care may be a challenging issue.

THE COMPLEXITY OF FOOT CARE

There is growing evidence that foot care is a complex part of diabetes management (35). Reasons for this could be attributed to the complexity of diabetic foot disease itself and the factors associated with patients and with health care delivery systems.

A review of the literature suggests that people with diabetes have poor adherence to preventive measures (36). This is coupled with the nature of diabetic foot disease as an insidious syndrome, which in its early stages does not encourage people to practice preventive measures or seek early health advice because poor peripheral sensory functions mask their pain. Therefore, these patients may only seek treatment in the advanced stages of ulcers when healing is difficult because of the multi-systemic effects of diabetes. In the advanced stages of diabetic foot ulcers, deep structures of the foot such as tendons, joints and bones may be involved (37). This requires intervention from different professionals such as vascular surgeons, orthopaedic surgeons, podiatrists and nurses. The coordination of such care may be difficult in some health care systems like Australia (38), although evidence has been documented on the substantial benefits of using a multidisciplinary approach in reducing the incidence of recurrent ulcers and amputation

rates for patients with this condition (39–41). However, the multidisciplinary clinics featured in these reports mainly focused on high-risk cases of diabetes-related foot problems. There is a clear need for preventive action to be taken at relevant stages by primary providers of diabetes care. Within this, foot screening could play an important role.

FOOT SCREENING

Foot screening is an examination of the foot using preliminary manoeuvres such as inspection and palpation. It is recommended to identify neuropathic, structural foot deformity and circulatory sequelae of diabetes in their early stages, where the prevention of foot ulceration and amputation is possible (42). Although optimal robust research evidence is lacking on the frequency of foot screening, experts have agreed that foot screening is necessary at least annually (43).

Annual foot screening is considered a primary step towards the prevention of diabetic foot ulceration as it can identify cases at risk and provide a basis for prioritisation of cases with diabetic foot ulceration, so that appropriate foot care can then be delivered according to priorities established for each case (44,45). Hence, annual foot screening is not a single strategy that can prevent diabetic foot ulceration but is one strategy in a long cascade that together can reduce the incidence of this condition. Foot examination alone was not found to be associated with a reduction in diabetes-related amputations (44), whereas foot screening combined with other preventive measures significantly reduced the effects of diabetic-foot-related problems (7,46,47). In short, identifying people at risk of diabetic foot ulceration is the first step towards the prevention of diabetes-related foot problems, and foot screening is an appropriate way to do that.

However, foot screening is infrequently performed for people with diabetes (10,11), despite the recognition of the effects of diabetic foot ulceration and the dissemination of national plans that stress the importance of annual foot screening for diabetes populations. The neglect of foot screening was recognised early; a review of studies investigating type 2 diabetes care in the United States of America (USA) during 1990s documented the fact that the primary providers of diabetes care were more likely to neglect foot examination than

blood pressure check (9). The National Swedish Board of Health and Welfare reported that more than 50% of 600 persons with diabetes had no foot screening at all within a period of 1 year (3). Therefore, countries set national targets for annual foot screening to reduce the suffering caused by diabetes-related foot problems. For example, the national targets of foot examinations are 80% and 75% each year for Australia (48) and the USA (49), respectively. Although these countries have achieved significant percentages of their national targets, these achievements are still below the targets. Achieved rates were less than 50% ($n = 475$) according to an Australian study published in 2004 (11) and 62% for the USA in 2001 (50).

The neglect of diabetic foot screening is a significant health care service delivery problem, and developing a better understanding of this issue requires an analysis within the context of health care services delivery. This is a multifaceted entity that results from a complex interaction between factors within and beyond the health care system. Currently, there is a movement towards the reform of health care services delivery in most countries around the world (51), as a result of social and economic factors (52,53). Health care has become an industry, and the cost-containment of any service is a primary determiner of who is responsible for the delivery of that service. Managers of the health care systems want to deliver high quality of care with low cost; therefore, roles have been shifted from some members of the health care team to others, for instance, from physicians to nurses, in order to reduce the cost (54). This economic imperative confronts another that stresses social values in terms of justice in delivering basic health care services of reasonable cost (55). This shifts the philosophy of health care from treatment of illness to health promotion and disease prevention. Therefore, it is necessary to analyse the lack of adherence of primary providers of diabetes care to performing annual foot screening in terms of professional, social, political and economic aspects of this phenomenon.

THE PROFESSIONAL ASPECT

Foot screening is a part of a comprehensive annual review of persons with diabetes, which aims to evaluate the effectiveness of care provided and signs of complications. This review is mainly provided by general practitioners

Key Points

- the neglect of diabetic foot screening is a significant health care service delivery problem
- health care has become an industry and the cost containment of any service is a primary determiner of who is responsible for the delivery of that service
- roles have been shifted from physicians to nurses to reduce the cost
- it is necessary to analyse the lack of adherence of primary providers of diabetes care to performing annual foot screenings in terms of professional, social, political and economic aspects of this phenomenon

Key Points

- health care providers may underestimate the seriousness of diabetic foot disease and the value of foot screening
- inconsistency in delineating the primary provider of foot screening may have scattered foot care between different members of health care teams

(GPs) and family physicians (56), who are reported to focus on biological features, for example blood glucose levels and medications, more than examination of the foot (9,57,58). One study (59) reported that GPs documented foot examinations for 18% of patients ($n = 467$), whereas for blood glucose levels, blood pressure and ophthalmoscopy, the rates were 70%, 94% and 52%, respectively. The American Diabetes Association recognises that physicians often do not perform foot examinations during annual diabetes review (9). This recognition is confirmed by the findings of a case note review (60), which found poor documentation of diabetic foot screening, even in the presence of other diabetes comorbidities, such as retinopathy, neuropathy and nephropathy, that increase the tendency to develop diabetic foot ulceration. Similarly, a national Australian study found that the feet of more than 50% of the diabetes population were not examined by a health care professional within a period of 12 months, whereas eye screening was done for more than 80% of the population (11). Therefore, health care providers may underestimate the seriousness of diabetic foot disease and the value of foot screening.

Foot examination is also neglected in hospitals, where many health professionals are involved in treating the multifaceted aspects of diabetic foot ulceration that include pathological changes in the vascular, neurological and integumentary systems. One American case note review (61) found that health professional adherence to examining the feet of patients who had been admitted to a large university teaching hospital with a principle diagnosis of diabetic foot infection was very poor. Similarly, an Australian case note review (62) found that the neglect of foot assessment for patients who had been hospitalised with acute foot complications reached the extent that the sensory functions of the foot were not examined for 84% ($n = 69$) of patients, and structural foot deformity was not checked at all. This neglect could be attributed to the fact that there is no distinct specialisation to deal with the foot in the field of medicine, which is historically the dominant profession in the health care area, as is the case with other diabetes comorbidities such as ischaemic heart disease, nephropathy and retinopathy. This has possibly reduced the attention given to foot care in the current health care systems. In this regard, this lack of

attention is noted in data reported from countries that have podiatrists in their health care systems, such as Australia (63) and the United Kingdom (UK) (64,65).

Podiatrists as health care professionals are concerned with the health of the lower limb and consider diabetic foot screening their duty (66,67). However, growing evidence suggests that podiatrists' performance of foot screening is not satisfactory. In this context, an audit showed that the percentage of patients who underwent foot screening in 66 centres was 40% ($n = 173$), although these centres were officially covered by podiatry services (64). A survey (65) found significant variations between 17 podiatrists who screened the feet of three persons with diabetes, in terms of foot deformity, appropriateness of footwear, vascular assessment and neurological assessment of the lower limb. Surprisingly, these foot screenings were done in podiatric clinics at the UK level that were responsible for assessing diabetic foot health on a regular basis. Similarly, a recent Australian study found that podiatrists had poor adherence to documenting risk factors of diabetic foot ulceration, such as poor skin integrity and pedal pulse (63). Moreover, the adherence to recording the status of peripheral sensory functions, which is a primary purpose of annual foot screening, was very poor. Surprisingly, these podiatrists did perform foot screening as a part of a multidisciplinary foot care programme.

It is unfortunate to find such variations within the profession that primarily deals with lower limb conditions. This may reflect a poor understanding of diabetic foot ulceration and underestimation of the seriousness of this condition. Indeed, the involvement of podiatrists in diabetes care is still in its early stages and their roles are not clearly demarcated (23), and in many circumstances, the duty of foot screening is given to nurses who might have a lack of adequate training in this regard (68).

Inconsistency in delineating the primary provider of foot screening may have scattered foot care between different members of health care teams. Several studies consider foot examination as a nursing duty and describe the way of performing this examination (69–71), whereas others consider foot screening as a physician's job (60,72). At the same time, others claim that it is more effective to use podiatrists for this job (66,67,73). An Australian

study reported that foot assessment was done by GPs, nurses, podiatrists and specialists for 17%, 25%, 71% and 10% of 52 patients, respectively (74). Such a situation may prevent standardisation in performing annual foot screening, resulting in poor quality of care delivered to patients. In this regard, the study cited earlier (74) indicated that patients received contradictory advice from different staff on managing their feet. Although the study had limitations that prohibit the generalisation of its findings to all diabetic foot care services, logic suggests that when different health professionals deliver a service with no standardisation, the quality of service delivered could vary. Importantly, there is no agreement on who should receive foot screening: every person with diabetes (75,76) or persons who have risk factors for diabetic foot ulceration (35,77). Such a situation may encourage the exploration of the political and social aspects of diabetic foot screening.

THE POLITICAL AND SOCIAL ASPECTS

As mentioned earlier, there are many players in health care service delivery who are within and outside the health care system. The absence of a clear delineation of who is the responsible professional to perform foot screening may lead to the confusion about this issue noted above. This is coupled with a lack of not only agreement on the components of the screening but also research evidence specifying the criteria for diagnosing peripheral neuropathy and standard equipment required to detect that neuropathy (45), although the nylon monofilament test has been recommended (78). Additionally, the absence of accredited formats or insufficiently current ones for the detailed documentation of the findings of the screening may complicate the situation (63). Although there is growing awareness of the importance of primary preventive diabetic foot care, there is a shortage of this care even in countries that have good health care services (22,79,80). Additionally, complex cases of diabetic foot ulceration might attract the most attention in health care systems.

The above situation might conflict with social values that try to make basic health care services accessible to all people regardless of their geographical locations and their ability to pay (55). The provided services should also be of good quality; therefore, accountability for these services is essential (55). In short, it seems

clear that diabetic foot screening does not fulfil the social requirements of health care services in terms of equity, quality and accountability in the provided service. This reflects on people with diabetes, as consumers for this service. These reflections could be identified through consumers' satisfactions with annual foot screening and their quality of life. In brief, this relates to the effectiveness of foot screening to overcome diabetes-related foot problems from the patient perspective. However, it could be a challenge to identify patient satisfaction with this service since it is a small fraction within a complex formula of foot care services (8). Therefore, the value of foot screening can be examined within the context of broader foot care services, which should be evaluated by the level of patients' satisfaction with accessibility to those services and the value of those services in improving their quality of life.

However, it could be difficult to identify the effectiveness of foot screening from patients' points of view because there is a relative paucity of research that investigates diabetic foot in general and diabetic foot care in particular (81). Moreover, many people with diabetes may not recognise the seriousness of diabetic foot ulceration (11); therefore, they might not seek foot screening. Thus, above all, people with diabetes need to know that foot screening is a part of their diabetes screening. After that, research evidence is needed to evaluate this foot assessment in terms of patient satisfaction and quality of life, which is the logical sequence to the prevention or amelioration of diabetes-related foot problems. In other words, it is possible to recognise this value in improving patients' quality of life because foot screening is a method of triage and for the distribution of cases to the appropriate level of care (45). As a result, a reduction would be achieved in the incidence and severity of diabetic foot ulceration, which is associated with poor quality of life (82,83). Additionally, this achievement would reduce the rate of diabetes-related amputations (19), which is also associated with poor quality of life (83). Thus, diabetic foot screening would improve patients' quality of life by preventing conditions associated with poor quality of life.

ECONOMIC ASPECTS

Money is a major driving force in most health care systems, and time spent to deliver a health

Key Points

- an Australian study reported that foot assessment was done by GPs, nurses, podiatrists and specialists
- such a situation may prevent standardisation in performing annual foot screening resulting in poor quality of care delivered to patients
- the study also cited that patients received contradictory advice from different staff on managing their feet
- the absence of a clear delineation of who is the responsible professional to perform foot screening may lead to the confusion of this issue
- this situation might conflict with social values that try to make basic health care services accessible to all people regardless of their geographic locations and their ability to pay

Key Points

- the time spent to deliver a health care service is estimated in terms of monetary value
- the initiation of a new service requires the estimation of the cost containment value of that service
- it was reported that patients who participated in a diabetic foot screening and protection programme had a statistically significant low rate of amputation in comparison with those who did not
- the cost of the programme per patient was £100, while the cost of amputation was £12,000 per patient

care service is estimated in terms of its monetary value (52). Some health care systems do not provide financial coverage for the performing of foot screening (38,58); therefore, health care administrators might not be interested in legitimate foot screening while it is a non profit task. The initiation of a new service requires the estimation of the cost-containment value of that service (52). The cost-containment value of foot screening can be recognised from two perspectives: first, the cost of performing that screening and second, the outcomes that will be gained from the application of the test. Annual foot screening is an inexpensive strategy for identifying groups at risk of diabetes-related foot problems since it is based on the implementation of simple tasks and uses simple equipment. This becomes clear if the cost of this screening is examined, on one hand, against the expected outcomes of the screening and on the other hand, against the outcomes resulting from non adherence.

The expected outcome of annual foot screening is identifying patients at risk for foot ulceration in order to direct them to another stream of care that could prevent or delay the development of foot ulceration (45), reduce the incidence of lower limb amputations (19) and result in substantial savings (84). In short, foot screening would reduce the financial burden of diabetes-related foot problems. It was reported that patients who participated in a diabetic foot screening and protection programme had a statistically significant low rate of amputations in comparison with those who did not participate in that programme (7). Moreover, the cost of the programme per patient was £100, while the cost of amputation was £12 000 per patient.

Hence, annual foot screening could be a cost-effective strategy to save money that has previously been spent on the management of diabetes-related foot problems, particularly the large fraction of diabetes budgets spent in managing these problems. This fraction is substantial, to the extent that the presence of peripheral vascular disease is associated with a 10–30% increase in the cost of management of a person with type 2 diabetes (85), and the presence of peripheral neuropathy is associated with a 27% increase in the cost of diabetes management (86). Moreover, the cost of surgery in the lower limb for patients with diabetes is 30% more than for those without

diabetes (87). The neglect of diabetic foot screening would thus seem to have a role in the huge figure that has been spent to manage diabetes-related foot problems. Addressing such a complex situation requires public efforts to provide political, professional and financial support.

TOWARDS A SOLUTION

Solving such a serious problem requires efforts from different parties within and beyond the health care systems. Importantly, foot screening is interrelated with other strategies of optimising foot health (7,46,47). Simultaneously, this screening can help in early detection of cases with diabetic foot, as the cases would be reported to the appropriate level of care. In other words, foot screening should work within the context of foot, so the appropriate level of foot care would be directed to the appropriate patients. Accordingly, foot screening would be the initial part of any foot care programme.

The Central Huddersfield Foot Health Department (CHFHD), UK, initiated a programme for triage and foot care pathways for persons with diabetes (88). The programme tried to overcome the pitfalls of other multi-disciplinary foot care programmes (7,38) that linked the preventive care to acute care settings where it could be problematic to screen all diabetes cases. Not only is the number of these cases increasing alarmingly, causing difficulties in screening in hospital settings (31,32,89) but also people with diabetes are mainly the ageing population (32,33,89), and they could often have physical limitations to get access to hospital settings. Hence, the CHFHD programme provided screening services on a community basis, and patients were then referred to the appropriate services that were offered bimonthly at central specialised clinics (88). However, it is doubtful that all patients with diabetes had access to the CHFHD programme (88). Although it was directed to include all patients, it recruited patients from local diabetes registries and from primary providers whose adherence to keep records of their patients is questionable (90). Such a programme needs to be directed towards maintaining equity, affordability and quality in delivering foot screening for the diabetes population in total.

Indeed, making annual foot screening accessible to the total population with diabetes

could be very difficult because it is an insidious disease and 50% of those suffering from the disease remain undiagnosed (33). Therefore, the first step should be identifying all cases with diabetes, and foot screening can then be directed to the diagnosed cases. However, this could also be problematic because a lack of adherence to follow-up appointments is a chronic problem among those patients (36,91). At the same time, central diabetes registries that help in monitoring screening programmes at national levels may still not be available in many countries (92). Accordingly, it would be more convenient to offer foot screening services by local health care institutions such as community care centres and GP clinics close to where patients live, as in the case of the programme mentioned above (88). Home visits also need to be taken seriously in order to deliver foot screening for those with limitations in accessing health care facilities and also to assess sources of harm in the home environment (10). This would free patients from the difficulties of attending secondary health care institutions where there are long waiting lists (93). In short, providing foot screening on a community basis may have advantages to patients.

However, offering foot screening in primary health care institutions may bring a conflict from two perspectives. First, the involvement of different health professionals in the task may not solve the problem of a lack of standardisation in the provided service. Second, one could say it is better to assign this job to podiatrists because lower limb is their area of specialisation. Indeed, the issue should be ensuring accurate performance of the screening, rather than who performs the assessment. The limited number of podiatric clinics (22,23,77) and the epidemiological characteristics of diabetes may place the responsibility of foot screening on other members of the diabetes health care team, for example nurses or physicians.

However, it is necessary to legitimise the responsibility of performing foot screening to ensure proper delivery of the service. This legitimisation should be accompanied by appropriate training of the assigned health care professionals, the availability of evidence-based guidelines, appropriate formats to document the findings of foot screening and clear referral pathways to the available services, as

in the case of the CHFHD programme (88). In this regard, it is also necessary to acknowledge the efforts of the International Working Group on the Diabetic Foot, which aims to institute a consensus on foot care at the global level. Accordingly, the Group has published practical guidelines on diabetic foot care (94). The implementation of such measures would establish accountability for the performance of foot screening, standardise the quality of screening and maintain continuity of care.

Central diabetes registries are also necessary to ensure that all people with diabetes have received all components of annual review such as eye screening, foot screening and glycaemic control (95). Diabetes registries are electronic files that provide a mode of communication between all providers of diabetes care where a quick access to patients' details, tests results and exchange of information are provided (96). Likewise, electronic recall systems can be provided where reminders can be sent to patients and health care professionals as well (97).

However, developing central diabetes registries and building legislation that demarcates the strategy of foot screening are situated within the long-term efforts of preventing diabetic foot ulceration. Such things could take a long time to be applied in the real situation, whereas the seriousness of diabetic foot ulceration requires management in the short term in addition to the long term.

Above all, people with diabetes should know that foot examination is part of their diabetes care. Health care professionals should also be aware of the importance of foot screening. Several reports have documented the significant value of organised education campaigns in increasing staff adherence to perform foot screening (60,98). Education is also important in helping patients to be proactive in seeking foot screening (97). Advising patients to take their shoes off before undergoing annual diabetes review is also a good reminder to screen the feet (60,71). The presence of flow charts and/or checklists for reviewing patients with diabetes is a good strategy to remind care providers to check the feet and/or refer patients to the appropriate services (99). Moreover, linking foot assessment with other screenings (e.g. eye screening) that are applied for people with diabetes can improve the adherence to foot examination (90,100). This link could make foot screening

Key Points

- it is necessary to legitimise the responsibility of performing foot screening to ensure proper delivery of the service
- another area is the implementation of Central Diabetes Registries that provides a mode of communication between all providers of diabetes care where a quick access to patient's details, test results and exchange of information are provided
- education is also important in helping patients to be proactive in seeking foot screening

Key Points

- this study provides evidence that primary providers of diabetes foot care do not often perform foot screening for people with diabetes
- legitimisation of foot screening is necessary to establish performance standards for this service

a prerequisite for eye screening. In other words, health care providers' attention to screening the foot would increase.

CONCLUSIONS

This study provides evidence that primary providers of diabetes foot care do not often perform foot screening for people with diabetes (3,9–11,59,60). This lack of adherence could be attributed to a wide range of reasons. For example, the involvement of different professions in this screening, factors associated with patients themselves and absence of clear referral pathways for foot care services in the current health care systems. Offering this screening in community settings might help make foot screening accessible to all people close to their place of living within reasonable costs. Establishing central diabetes registries, supported by a patients' reminder system, is a helpful strategy in maintaining equity in the delivery of foot screening in the long term (95). This long-term strategy needs to be preceded by strategies that increase staff skills in and awareness of this screening. Finally, legitimisation of foot screening is necessary to establish performance standards for this service.

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