Contents available at ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

International Diabetes Federation

Multidisciplinary diabetic foot care in Sweden – A national survey

Linda Wennberg [*], *Sarah Widgren* [1], *Rimma Axelsson* [2], *Kurt Gerok-Andersson* [3], *Börje Åkerlund* [4]

Department of Clinical Science, Intervention and Technology (CLINTEC), Karolinska Institute and Department of Radiology, Karolinska University Hospital, Huddinge, Sweden

ARTICLE INFO

Article history:
Received 30 October 2018
Received in revised form
5 January 2019
Accepted 4 February 2019
Available online 7 February 2019

Keywords:
Multidisciplinary
Diabetic foot
Amputation
Consensus

ABSTRACT

Aim: To investigate at a national level the multidisciplinary team (MDT) care of patients with diabetes mellitus and foot complications.

Methods: A questionnaire was sent to all 75 Swedish hospitals with emergency departments, which were grouped according to size.

Results: The response rate was 92%, 58/69 of the hospitals have a foot team. Most teams have *access* to an internal medicine specialist/diabetologist, podiatrist and orthotist. Fewer teams reported access to an orthopaedic surgeon and infectious diseases specialist and only half to a vascular surgeon. In joint MDT *outpatient* evaluations, the majority report the presence of an internal medicine specialist, podiatrist and orthotist, but 50% an infectious disease specialist and orthopaedic surgeon and only a few a vascular surgeon. *In hospitalized* patients, there is a reduction in the presence of all specialists. The registration of amputation rate and healed foot ulcers is low.

Conclusions: MDT care is mostly adopted among large and medium-sized hospitals in contrast to small ones, which could reflect unequal health care. Vascular surgeons seldom are present at MDT evaluations and there is a reduced regular input of specialists in the evaluation of hospitalized patients. The hospitals' ability to evaluate their work by potential quality control markers is poor.

1. Introduction

Diabetes mellitus (DM) is often accompanied by foot complications e.g. foot ulcers. Up to 50% of people with type 2 diabetes have so-called at-risk feet [1], and up to 85% of diabetic lower extremity amputations (LEA) are preceded by an ulcer [2]. A multidisciplinary team (MDT) care is recommended on an international [3] and national [4] level with the aim of reducing the amputation rate [1,5]. An MDT is a group of specialists with different, complimentary experience

* Corresponding author at: Karolinska Institute, Department of Clinical Science, Intervention and Technology (CLINTEC), Division of Radiography, Alfred Nobels Allé 10, 141 83 Huddinge, Sweden.
E-mail address: linda.wennberg@ki.se (L. Wennberg).
[1] Address: Department of Orthopaedic Surgery, Danderyd Hospital, Sweden.
[2] Address: Department of Clinical Science, Intervention and Technology (CLINTEC), Karolinska Institute and FO Medical Physics and Nuclear Medicine, Imaging and Function, Karolinska University Hospital, Huddinge, Sweden.
[3] Address: Department of Endocrinology, Karolinska University Hospital, Stockholm Huddinge, Sweden.
[4] Address: Department of Medicine, Unit of Infectious Diseases, Karolinska University Hospital, Stockholm Huddinge, Sweden.
https://doi.org/10.1016/j.diabres.2019.02.003
0168-8227/

and knowledge that contribute to achieve specific objectives in an organization [6]. However to emphasis the evidence of a positive impact of the MDT, further high quality studies are required [7]. Despite evidence supporting an MDT approach of this patient group, it is unclear how well a multidisciplinary care is established at a national level in the developed countries. The Swedish National Board of Health and Welfare has conducted a national evaluation of compliance with the national guidelines for diabetes care among diabetic clinics. The results of the evaluation indicate that 70% of the responding diabetic clinics have access to an MDT, but no deeper analysis of the MDT composition has been presented [4]. To our knowledge there has been no evaluation of how patients with DM and foot problems are managed in the MDT context in Sweden as of today.

The achievement of a decreased amputation rate in patients with diabetes and foot ulcers, since the Saint Vincent Declaration in 1989 [8] has been associated not only with the setup of an MDT approach, but also other factors including improvements in healthcare processes and organizational structures and the implementation of treatment guidelines. Furthermore, improved diagnostics by vascular imaging and improved revascular interventions, extended utilization of off-loading equipment, improved patient education and early referral from primary care to the hospital's diabetic foot team have contributed to the results. The establishment of MDT has also resulted in a decreased re-amputation rate and a reduction in hospitalization due to diabetic foot complications [9]. Although only a minority of all diabetic foot ulcers will end in a proximal amputation, these amputations are associated with substantial costs to society and suffering on the part of the patients. It has been suggested that it can even be cost-effective to introduce an MDT [9,10].

In addition to the financial burden, patients with a foot ulcer value their health-related quality of life lower than patients in whom healing has been accomplished [11]. Not surprisingly, health-related quality of life is reduced after a major amputation [12]. Notably, patients with DM and an ongoing foot ulcer fear amputation more than death [13]. Furthermore, patients with foot ulcers not only suffer from different comorbidities to diabetes but also from premature death [14].

In the Saint Vincent Declaration, a five-year target was set to reduce diabetic complications by improving the care for these patients across Europe. A major aim was, in a ten-year perspective, to reduce the amputation rate by 50% [15]. As a follow up of the St Vincent Declaration, an expert panel met in Stockholm in 1998 to create consensus about the organization of how to prevent and treat foot ulcers in patients with DM: "*Foot problem of diabetics: Consensus Statement*"[16]. The importance of an MDT care was stressed and the need for implementing such team was underlined. MDTs of different composition at different levels were recommended for primary care, local hospitals and large (university) hospitals. Primary care is responsible for the prevention of foot ulcers. The appearance of an ulcer demands collaboration between primary care and a foot team at a local hospital. The local hospital team, according to the Consensus Statement, preferably consists of an internal medicine specialist, a surgeon or an orthopaedic surgeon and a podiatrist. They represent the medium level of the diabetic foot care in investigating and treating foot lesions. In addition, the establishment of some diabetic foot centres in larger hospitals was recommended, with expertise including a diabetologist, diabetes specialist nurse, orthopaedic surgeon, vascular surgeon, infectious disease specialist, podiatrist orthotist, radiologist and physiotherapists.

The major aim of this study was to investigate whether the recommendations of the *Stockholm Consensus Statement* regarding the establishment of MDTs for the management of DM patients with foot complications is fulfilled at all hospitals with emergency departments in Sweden. Furthermore, we have also briefly tried to analyse the intention of evaluating the work by potential quality control markers.

2. Method

Data was collected in late 2013 using a structured questionnaire developed in collaboration between the Diabetic Foot Centre Karolinska (DFCK) and the Swedish Diabetic Association. The questionnaire consists of eight questions regarding the management of patients with DM and foot complications. We analysed which hospitals had an MDT and their access to different specialists as well as those specialists regular input in the joint MDT evaluation of outpatients and of hospitalized patients. Furthermore, we asked for treatment guidelines and whether the hospitalized patients were on a specialized ward or if they have scattered beds.

The questionnaire also investigated potential quality control markers such as a local registration of the annual number of amputations on patients with DM as well as a registration of healed ulcers. We also asked whether the patient received a treatment message when visiting the clinic.

Based on the Swedish Association of Local Authorities and Regions' registry, the questionnaire was distributed by post to all of the 75 Swedish hospitals with an emergency department. The staff member responsible for diabetic foot care was identified at each hospital and received the encoded questionnaire.

Information concerning the number of beds available at each hospital was collected from the hospital's webpage. To analyse national differences in the MDT care, the hospitals were grouped into 3 categories according to number of beds: small hospitals <250 beds, medium-sized hospitals 250–500 beds and large hospitals >500 beds. Small hospitals consisted of local, community hospitals, the medium-sized ones of regional, emergency hospitals and the large ones of university hospitals. The anonymized data were downloaded into the Microsoft Excel software package, and analysed in terms of frequencies and percentages.

3. Results

There was a 92% response rate (69/75). Eleven respondents stated that they had no MDT and instead they referred complicated patients to different hospitals, and they are, therefore, not included in the analysis. These hospitals consisted of 9 small and two medium-sized hospitals. Of the 58 hospitals that stated they had an MDT, 26 were classified as small, 16 as medium-sized and 16 as large.

3.1. *The MDT´s access to different specialists*

The most common staff members reported in MDT were a podiatrist and an orthotist. The specialists that the foot team had access to (Table 1) did not have to be part of the foot team, but had to be available for patient evaluation as e.g. consultants. If a hospital answered that they had access to both an internal medicine specialist and a diabetologist, only the diabetologist was counted.

3.2. *Specialists with regular input in the MDT evaluation of outpatients*

Specialists with regular input in the joint MDT evaluations of *outpatients* were primarily internal medicine specialists/diabetologists (90%), podiatrists (95%) and orthotists (88%) (Fig. 1). In about half of the teams, infectious disease specialists (52%) and orthopaedic surgeons (62%) were present at the MDT joint evaluation, while few teams reported that vascular surgeons (22%) were present.

3.3. *Specialists with regular input in the MDT evaluation of hospitalized patients*

The specialist that was reported most frequently having a regular input in the MDT joint evaluation of *hospitalized* patients was an internal medicine specialist/diabetologists (60%) (Fig. 2). In approximately half of all teams, an orthopaedic surgeon (48%), an infectious disease specialist (41%) and a podiatrist (40%) were present in the joint MDT evaluation of hospitalized patients. Few hospitals reported that an orthotist (29%) or a vascular surgeon (21%) were present.

3.4. *Organisation of hospitalized patients in MDT care*

For hospitalization of patients with DM and foot complications 60% of hospitals with an MDT have 50%, 69%, and 69% respectively according to size. Ten percent report that they have both scattered beds and a specialized ward (4%, 19%, and 13% respectively). Fifty percent of the hospitals with MDT have reported that they used scattered beds (54%, 50%, and 44% respectively).

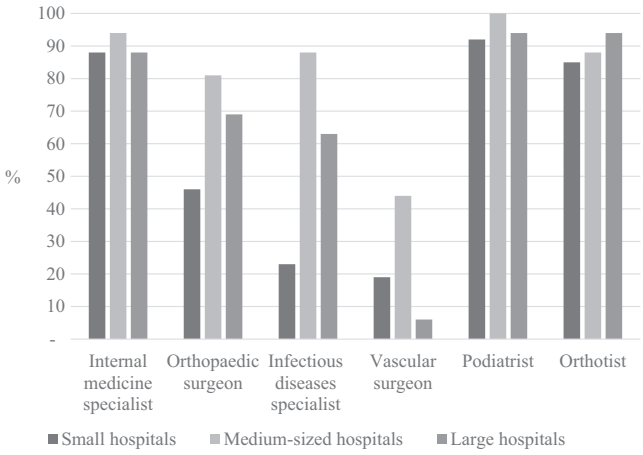

Fig. 1 – Specialists attending MDT evaluation in outpatient care.

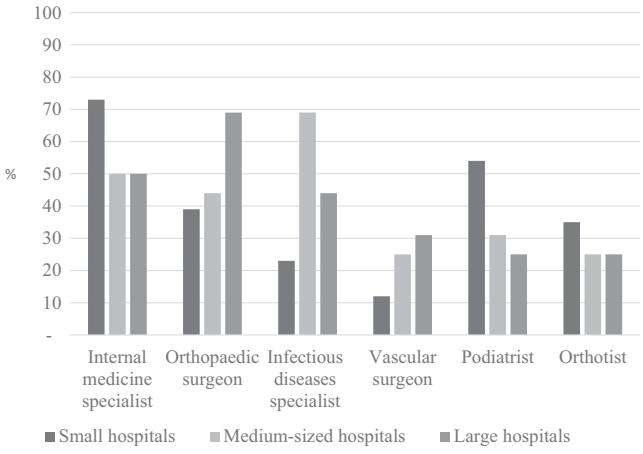

Fig. 2 – Specialist that attend the MDT evaluation of hospitalized patients.

Table 1 – Specialists that the MDT reported they had access to.

Specialists	Small hospitals n = 26 (%)	Medium-sized hospitals n = 16 (%)	Large hospitals n = 16 (%)	Total n = 58 (%)
Specialist in general internal medicine	8 (31%)	0 (0%)	1 (6%)	9 (16%)
Diabetologist	15 (58%)	15 (94%)	15 (94%)	45 (78%)
Specialist in orthopaedic surgery	9 (35%)	3 (19%)	3 (19%)	15 (26%)
Orthopaedic surgeon with experience in foot surgery	8 (31%)	12 (75%)	10 (63%)	30 (52%)
General infectious diseases specialist	9 (35%)	5 (31%)	9 (56%)	23 (40%)
Infectious disease specialist with experience in orthopaedic infections	2 (8%)	10 (63%)	3 (19%)	15 (26%)
General vascular surgeon	6 (23%)	2 (13%)	1 (6%)	9 (16%)
Vascular surgeon with experience in extremity surgery	5 (19%)	8 (50%)	9 (56%)	22 (38%)
Podiatrist	25 (96%)	16 (100%)	15 (94%)	56 (97%)
Orthotist	23 (89%)	15 (94%)	15 (94%)	53 (91%)
Diabetis specialist nurse	23 (89%)	13 (81%)	8 (50%)	44 (76%)

3.5. *Characterization of quality control*

Sixty-seven percent of the hospitals claimed that they had established guidelines for managing patients with DM and foot ulcers (62%, 69%, and 75% respectively). However, when asked to bring the guidelines together with the questionnaire only a few were included.

In forty-eight percent of the hospitals with MDT, there was local registration of the annual number of amputations (42%, 56%, and 50% respectively), and 21% of the hospitals reported having a local register of the number of healed foot ulcers (12%, 19%, and 38% respectively). Eighty-six percent of the hospitals stated that the patients received a treatment message for their general practitioner and primary care nurse when visiting the clinic (81%, 81%, and 100%).

4. Discussion

An LEA preceded by a diabetic foot ulcer could partly be prevented in the 21st century with optimal care and organization around the patient. A recent study indicates that two-thirds of the patients with diabetes and foot ulcer are healed after a long healing time without an amputation when treated in a multidisciplinary setting [17]. According to the Stockholm Consensus Statement [16], the MDT is preferably present with different compositions at different levels in the health care system. In primary health care, it is recommended that the team is smaller, while, in the local and regional hospital, the team should consists of more specialists. Finally, the recommendation is that some foot centres are established with a complete MDT. The collaboration between primary care and hospitals on treatment and prevention is essential for optimal outcome for the patients with DM and foot complications [16].

This survey shows that the recommendations in the Stockholm Consensus Statement concerning an MDT approach are to some extent adopted among large and medium-sized hospitals in contrast to small hospitals. In large and medium-sized hospitals there is an acceptable access to specialists except vascular surgeon. The regular input from these specialists in MDT joint evaluation of outpatients is high. Small hospitals have in some degree implemented the recommendations, but the majority have a lean MDT service to offer the patients. The access to specialists in these hospitals is also moderate. Naturally, small hospitals do not have the same resources as larger hospitals. However, this could in fact imply decreased quality of care and ultimately a higher amputation frequency, and thereby reflects an unequal care of patients with diabetes and foot complications at a national level. Hence, it is important to investigate this aspect further.

Eleven out of 69 hospitals reported that they do not have a foot team. Nine of them were small and two were medium-sized hospitals. A study from Norway reported that 17 out of 41 hospitals had diabetic foot ulcer team [18]. Understandably, some small hospitals have not established a foot team and deal with this by referring their patients to hospitals with MDT competence, as they report in the questionnaire. Patients with DM and foot complications certainly need access to the optimal hospital care with necessary specialists. In order to promote equal care regardless of geographical location, telemedicine may be suitable in order to reduce the need for hospital visits and ameliorate communication with specialists. Studies indicate positive experiences with the telemedicine approach on the part of health care professionals [19] as well as patients with diabetic foot ulcers [20]. In addition, no difference has been shown regarding the incidence of healing foot ulcers or amputation rates comparing telemedical and standard outpatient monitoring [21]. Telemedicine may also be the instrument that connects the small hospital's MDT to specialists needed in the larger hospital's diabetic centres.

Although the MDT evaluation of outpatients is acceptable, there is still a potential to increase the regular input of orthopaedic surgeons, infectious disease specialists, and especially vascular surgeons.

Nevertheless, in the MDT evaluation of hospitalized patients where there is much to gain in terms of improved healing, avoiding amputations and reduced length of hospitalization, our study shows an unacceptably low regular input of orthopaedic surgeons, vascular surgeons and infectious disease specialists at MDT joint meetings.

Instead of an increase, the regular input of all specialists' decrease when evaluating hospitalized patients compared to outpatients. Hence, in their clinical situation, these patients should have the maximal access to an optimal MDT evaluation in order to avoid amputation and reduce costs.

Vascular surgeons rarely have a regular input in the joint MDT evaluations, and few teams report that vascular surgeons are part of the MDT work when evaluating outpatients or hospitalized patients. The importance of early diagnosis of peripheral artery disease (PAD) and optimal endovascular interventions is stressed in several reports and plays a central role when saving the limb from amputation [22–24]. Therefore, it is remarkable that only 22% of all the national foot teams report having a vascular surgeon´s regular input in the MDT evaluation of outpatients or hospitalized patients.

The foot teams generally have good access to orthopaedic surgeons oriented toward foot surgery and internal medicine physicians specialising in diabetology. In contrast, the access to infectious disease specialists oriented toward orthopaedic infections is very low. The importance of optimal treatment of infection and highest competence within this area is underlined in the EURODIALE study [24,25]. In addition the National Institute for Health and Clinical Excellence (NICE) and Infectious Diseases Society of America (IDSA) also recommend that the MDT include or have access to an infectious disease specialist [26,27].

This national survey indicates that Swedish hospitals have low registration rate of potential quality control markers such as healed ulcers and annual amputation rate. We believe that quality control markers enable the follow up of the work and further development of the organization by creating opportunities to compare the work from one year to the next. A suitable marker for evaluating the quality is most likely the annual number of amputations [28] even if all patients with DM and an ulcer do not seek health care which could make the number hard to estimate.

Our study casts doubt on how well systematic management of patients with DM and foot complications is established in Swedish hospitals. Sixty-seven percent of all hospitals report having treatment guidelines. In the questionnaire, we asked the hospitals to attach their treatment guidelines, but only a few hospitals did. Studies from Norway and Denmark also reported that the diabetic foot ulcer team had low frequency of routines for assessment [18,29].

In this national survey, we can see possible areas for improvement in the MDT care for patients with DM and foot complications, especially for hospitalized patients. We also suggest new solutions in diabetic foot care e.g. telemedicine consultations especially in small hospitals where there seem to be difficulties in providing the optimal expertise for all clinical decisions. In accordance with reported audits in other countries especially United Kingdom we can from our study also se certain values in national surveys in order to evaluate the care of patients with DM, allowing an organization to deal with inadequacies in its management [30–34]. The national survey should then be repeated regularly so as to monitor improvement in the diabetic foot care. We therefore recommend, at an international level national surveys to evaluate the care of patients with DM and foot complications.

4.1. *Conclusion*

Our main conclusion from this study is that, in Sweden, few clinics have a regular input from orthopaedic surgeons, infectious disease specialists, vascular surgeons and podiatrists at MDT joint evaluations of particular, hospitalized patients with DM and foot complications. Furthermore, Swedish hospitals have a low registration of potential quality control markers e.g. healed ulcers and annual amputation rates.

Acknowledgement and funding

This study was supported by the department of Endocrinology at Karolinska University Hospital with a grant of 15000 SEK net. We would like to thank the participating hospitals and the staff member responsible for diabetic foot care that contributed data to this study.

Competing of interest

None.

Author contributions

S. Widgren assisted with the study design, collected research data, conducted data analyses and wrote the manuscript. L. Wennberg was involved in data analysis, interpretation of results and wrote the manuscript. R. Axelsson assisted by editing the manuscript. B. Đkerlund and K. Gerok-Andersson assisted with the study design and designed the questionnaire, supervised, reviewed and edited the manuscript. L. Wennberg and S. Widgren are the guarantors of this work and, as such, had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.diabres.2019.02.003.

REFERENCES

[1] Bakker K, Apelqvist J, Schaper NC. Practical guidelines on the management and prevention of the diabetic foot 2011. Diabetes Metab Res Rev [Internet]. England 2012(28):225–31.
[2] Boulton AJM, Kirsner RS, Vileikyte L. Neuropathic diabetic foot ulcers. N Engl J Med [Internet] 2004;351(1):48–55. Available from: http://www.ncbi.nlm.nih.gov/pubmed/15229307.
[3] Schaper NC, Apelqvist J, Bakker K. Reducing lower leg amputations in diabetes: a challenge for patients, healthcare providers and the healthcare system. Diabetologia 2012;55(7):1869–72 [Internet]. Germany.
[4] Nationella riktlinjer - utvärdering 2015. Diabetesvård: Rekommendationer, bedömningar och sammanfattning [Internet]; 2015. <https://www.socialstyrelsen.se/Lists/Artikelkatalog/Attachments/19687/2015-2-1.pdf>.
[5] Rubio JA, Aragón-Sánchez J, Jiménez S, Guadalix G, Albarracín A, Salido C, et al. Reducing major lower extremity amputations after the introduction of a multidisciplinary team for the diabetic foot. Int J Low Extrem Wounds [Internet] 2014;13(1):22–6. https://doi.org/10.1177/1534734614521234.
[6] Tan T, Shaw EJ, Siddiqui F, Kandaswamy P, Barry PW, Baker M, et al. Inpatient management of diabetic foot problems: summary of NICE guidance. BMJ [Internet] 2011;23(342)d1280.
[7] Buggy A, Moore Z. The impact of the multidisciplinary team in the management of individuals with diabetic foot ulcers: a systematic review. J Wound Care [Internet] 2017;26(6):324–39. Available from: http://www.ncbi.nlm.nih.gov/pubmed/28598756.
[8] Diabetes. care and research in Europe: the Saint Vincent declaration. Diabet Med [Internet] 1990;7(4):360.
[9] Nason GJ, Strapp H, Kiernan C, Moore K, Gibney J, Feeley TM, et al. The cost utility of a multi-disciplinary foot protection clinic (MDFPC) in an Irish hospital setting. Ir J Med Sci [Internet]. Ireland 2013;182(1):41–5.
[10] Matricali GA, Dereymaeker G, Muls E, Flour M, Mathieu C. Economic aspects of diabetic foot care in a multidisciplinary setting: a review. Diabetes Metab Res Rev [Internet] England 2007;23(5):339–47.
[11] Goodridge D, Trepman E, Sloan J, Guse L, Strain LA, McIntyre J, et al. Quality of life of adults with unhealed and healed diabetic foot ulcers. Foot Ankle Int [Internet] 2006 Apr;27(4):274–80. Available from: http://www.ncbi.nlm.nih.gov/pubmed/16624217.
[12] Goodridge D, Trepman E, Embil JM. Health-related quality of life in diabetic patients with foot ulcers: literature review. J Wound, Ostomy, Cont Nurs Off Publ Wound, Ostomy Cont Nurses Soc [Internet] United States 2005;32(6):368–77.
[13] Wukich DK, Raspovic KM, Suder NC. Patients with diabetic foot disease fear major lower-extremity amputation more than death. Foot Ankle Spec [Internet] 2018;11(1):17–21. https://doi.org/10.1177/1938640017694722.
[14] Susan van D, Beulens JWJ, Yvonne T, Van der S, Grobbee DE, Nealb B. The global burden of diabetes and its complications: an emerging pandemic. Eur J Cardiovasc Prev Rehabil [Internet] 2010;17(1_suppl):s3–8.

[15] King H. WHO and the International Diabetes Federation: regional partners. Bull World Health Organ [Internet]. Switzerland 1999;77(12):954.
[16] Spri M forskningsrådet. Konsensusuttalande. Stockholm: Spri [Internet]. Spri tryck 317; 1998. http://diabetolognytt.se/nr3_98/konsens_uttalande.html
[17] Örneholm H, Apelqvist J, Larsson J, Eneroth M. Heel ulcers do heal in patients with diabetes. Int Wound J [Internet] 2017;14 (4):629–35. Available from: http://www.ncbi.nlm.nih.gov/pubmed/27487819.
[18] Robberstad M, Bentsen SB, Berg TJ, Iversen MM. Diabetic foot ulcer teams in Norwegian hospitals. Tidsskr Nor Laegeforen [Internet] 2017;137(17).
[19] Kolltveit B-CH, Gjengedal E, Graue M, Iversen MM, Thorne S, Kirkevold M. Telemedicine in diabetes foot care delivery: health care professionals' experience. BMC Health Serv Res [Internet]. BMC Health Services Res 2016;16(1):134.
[20] Smith-Strøm H, Iversen MM, Graue M, Skeie S, Kirkevold M. An integrated wound-care pathway, supported by telemedicine, and competent wound management—Essential in follow-up care of adults with diabetic foot ulcers. Int J Med Inform 2016;94:59–66. https://doi.org/10.1016/j.ijmedinf.2016.06.020 [Internet] Elsevier Ireland Ltd.
[21] Rasmussen BSB, Froekjaer J, Bjerregaard MR, Lauritsen J, Hangaard J, Henriksen CW, et al. A randomized controlled trial comparing telemedical and standard outpatient monitoring of diabetic foot ulcers. Diabetes Care [Internet] 2015;38(9):1723–9. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26116717.
[22] Larsson J, Eneroth M, Apelqvist J, Stenström A. Sustained reduction in major amputations in diabetic patients: 628 amputations in 461 patients in a defined population over a 20-year period. Acta Orthop [Internet]. England 2008;79 (5):665–73.
[23] Williams DT, Majeed MU, Shingler G, Akbar MJ, Adamson DG, Whitaker CJ. A diabetic foot service established by a department of vascular surgery: an observational study. Ann Vasc Surg [Internet]. Netherlands 2012;26(5):700–6.
[24] Schaper NC. Lessons from Eurodiale. Diabetes Metab Res Rev [Internet]. England 2012;28:21–6.
[25] Prompers L, Huijberts M, Apelqvist J, Jude E, Piaggesi A, Bakker K, et al. Optimal organization of health care in diabetic foot disease: introduction to the Eurodiale study. Int J Low Extrem Wounds [Internet] United States 2007;6(1):11–7.
[26] Diabetic foot problems: prevention and management | Guidance and guidelines | NICE. NICE; [cited 12.04.18]; <https://www.nice.org.uk/guidance/ng19/chapter/1-Recommendations#diabetic-foot-ulcer>.
[27] Lipsky BA, Berendt AR, Cornia PB, Pile JC, Peters EJG, Armstrong DG, et al. Executive summary: 2012 Infectious Diseases Society of America Clinical Practice Guideline for the Diagnosis and Treatment of Diabetic Foot Infectionsa. Clin Infect Dis [Internet] 2012;54(12):1679–84. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22619239.
[28] Jeffcoate WJ, Van Houtum WH. Amputation as a marker of the quality of foot care in diabetes. Diabetologia 2004;47 (12):2051–8 [Internet] Germany.
[29] Kirketerp-Møller K, Svendsen OL, Jansen RB. The management of diabetic foot ulcers in Danish hospitals is not optimal. Dan Med J [Internet] 2015;62(6).
[30] Jeffcoate W, Holman N, Rayman G, Valabhji J, Young B. New national diabetes footcare audit of England and Wales. Diabet Med [Internet] 2014;31(9):1022–3. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24823427.
[31] Johnston P. National Diabetes Inpatient Audit: how can inpatient teams make patients feel safer? Br J Nurs [Internet] 2018;27(10):534–6. Available from: http://www.ncbi.nlm.nih.gov/pubmed/29791214.
[32] Dhatariya KK, Nunney I, Higgins K, Sampson MJ, Iceton G. National survey of the management of Diabetic Ketoacidosis (DKA) in the UK in 2014. Diabet Med [Internet] 2016;33 (2):252–60. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26286235.
[33] Normahani P, Mustafa C, Standfield NJ, Duguid C, Fox M, Jaffer U. Management of peripheral arterial disease in diabetes: a national survey of podiatry practice in the United Kingdom. J Foot Ankle Res [Internet] 2018;11:29. Available from: http://www.ncbi.nlm.nih.gov/pubmed/29930710.
[34] Commons RJ, Raby E, Athan E, Bhally H, Chen S, Guy S, et al. Managing diabetic foot infections: a survey of Australasian infectious diseases clinicians. J Foot Ankle Res [Internet] 2018;11:13. Available from: http://www.ncbi.nlm.nih.gov/pubmed/29651304.