

foot Scape

Newsletter

March, 2017

Happy new year to all Footscape members and supporters. Community engagement continues to be a high priority for our governing committee. Indeed Footscape endeavours to inform, educate and motivate Podiatrists, other health professionals and the greater community in regards to the foot health inequity encountered by disadvantaged persons. During the final months of 2016 Footscape committee members delivered annual presentations to Podiatry students at La Trobe University and Western Sydney University. The continual enthusiasm of students to learn more about foot health issues amongst marginalised population groups remains ever constant and with it brings a sense of optimism.



From the
President



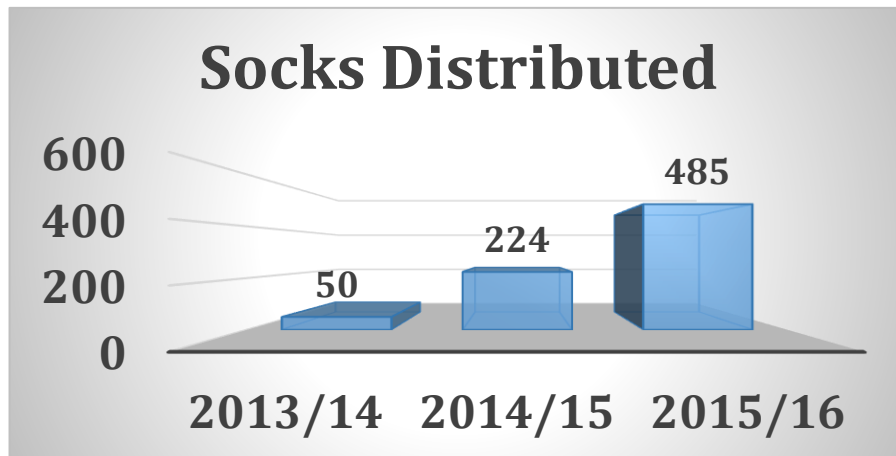
Footscape Committee Member Stephanie Morrice presenting to her fellow Podiatry graduates at La Trobe University on Professional Issues Day.

During the year a second student essay competition was held as part of the Western Sydney University fourth year *Professional Practice Studies* unit. Students were asked to choose a population group considered to experience social and health inequity then conduct a systematic search and critical review of the literature detailing the influence of social determinants of health upon foot pathology in that

From the President

(continued)

group. Many fine essays were received. The University Podiatry Department and Footscape Committee have selected a winning essay. Congratulations to Ryan Romero who will be presented with a \$250 cash prize. Ryan's unedited essay (less references) pertaining to the gap between Indigenous and non-Indigenous Australians in the diabetic foot is now presented in this newsletter.



For several years Footscape has been collating new socks for distribution to homeless and other disadvantaged persons. Painful skin and nail problems affecting such individuals can be accentuated as they are commonly forced to wear poor socks. Following a cold and wet Melbourne winter in 2016 demand at our project partnering organisations had been high. Accordingly our governing committee initiated a Sock Drive during Foot Health Month in October to attend to this necessity. The event would equally serve as a community engagement platform with private Podiatry clinics across Melbourne invited to serve as collection points. Accordingly I would like to acknowledge the following Clinics for participating:

Atherton Road Podiatry Centre, Oakleigh	Langmore Podiatry, Berwick
Collins West Foot Clinic, Melbourne	ProActive Podiatry, Mornington

I'm now delighted to announce the Sock Drive raised over four hundred new pairs of socks. In response to this great success Footscape is encouraging Podiatry Clinics around Australia to actively participate in the Sock It To 'Em project by serving as collection points upon an ongoing basis for persons willing to donate new socks. Your involvement with this project will be formally acknowledged through:

- Reference to business name in Footscape's quarterly electronic newsletters and Annual Report during the period of your support; and
- Periodic references of your support on Footscape's Facebook and Twitter social media communications.

If your Clinic is interested in participating please contact the Footscape team.

*Anthony Lewis
President*

The gap between Indigenous and non-Indigenous Australians in the diabetic foot

Ryan Romero

1. Background

Diabetes is one of the most common chronic diseases in Australia (Whiting, Guarigutata, Weil & Shaw, 2011). While Indigenous Australians only account for 3% of the Australian population (Australian Bureau of Statistics, 2014a), they are overrepresented in diabetes statistics. Government reports suggest Indigenous Australians are twice as likely to have diabetes than non-Indigenous Australians (Australian Bureau of Statistics, 2014c; Australian Bureau of Statistics, 2015).

Diabetes-related lower-limb complications (LLC) are among the most severe and frequent complications of diabetes. While the prevalence of diabetes is higher in Indigenous Australians, the prevalence of LLCs is significantly larger. A likely factor in this is due to the lack of access and knowledge of culturally appropriate podiatric healthcare services. This review will aim to consolidate the evidence in the literature regarding the gap between the Indigenous population and non-Indigenous population in diabetes and its LLCs, and the identified determinants contributing to this gap.

2. Findings

2.1 Diabetes Prevalence

Diabetes is one of the most common chronic diseases in Australia, and continues to rise in numbers, particularly due to changing lifestyles characterised by poor physical activity, and increased obesity (Whiting et al., 2011).

2.1.1 Prevalence in non-Indigenous Population

The most recent figure of the number of people with diabetes in the overall Australian population has been estimated at 5.1% (Australian Bureau of Statistics, 2015). However, a cross-sectional study of 11,247 random participants reported a much larger figure not reported in any government report at 7.4% (Dunstan et al., 2002). The advantage of this study is that it also included participants with no knowledge of having diabetes, and then included those that met the diagnostic criteria for diabetes. This suggests that current government figures may be even higher due to their design of only covering self-reported cases of diabetes, excluding many undiagnosed.

2.1.2 Prevalence in Indigenous Population

Indigenous Australians are among those with the greatest burden of disease related to diabetes. The Australian Bureau of Statistics (2014c) estimate 11.1% of Indigenous Australians have diabetes, more than twice the number of non-Indigenous Australians.

Minges et al. (2011) conducted a systematic review of observational studies into the prevalence in the Indigenous population. While including government reports, it also included studies of the peer-reviewed literature. This allowed for the results to be considered more accurate by not including only the self-reported cases of diabetes in government results. It showed the prevalence of diabetes in the Indigenous population ranged between 3.5% and

33.1%. It is important to note that of the 24 studies in the review, all but 3 found a higher prevalence in the Indigenous population. However, due to the heterogeneous nature of the studies, the findings of this review must be taken with caution in terms of its generalisability. This is because some of the studies, including those that found a lower Indigenous prevalence, had small sample sizes, varying mean ages, and unequal gender ratios.

2.2 Impact of Diabetes

Indigenous and non-Indigenous Australians have an excess of avoidable diabetes-related LLCs, including PN and PAD, both independent risk factors for diabetic foot pathology like ulceration and LLA (Australian Institute of Health and Welfare, 2008; Charles, 2015).

2.2.1 Peripheral Arterial Disease & Peripheral Neuropathy

Of the studies that have examined the prevalence of PAD in those with diabetes in both populations in Table 1, it is clear that PAD is more prevalent in the Indigenous population. Given that smoking is a strong risk factor for PAD (Norman, Davis, Bruce & Davis, 2006), the higher rates of smoking reported in the Indigenous population may contribute to this figure (Australian Bureau of Statistics, 2014b).

The prevalence of PAD is noted as being significantly higher for rural and remote Indigenous Australians (O'Rourke, Steffen, Rauli & Tulip, 2013). This may be due to the rate of diabetes being higher in rural and remote Australia in Indigenous Australians (Australian Bureau of Statistics, 2014c). Of particular interest is the study by Maple-Brown et al. (2008), which was compared with the results by Tapp et al. (2003). It showed only a +2.8% difference of PAD in the Indigenous population. However, when adjusting for age, diabetes duration and current smoker status, Indigenous Australians are actually at a three-fold increased risk of PAD.

Although no study on the exact prevalence of PN in the Indigenous population exist, Indigenous Australians with diabetes are at a higher risk of PN than non-Indigenous Australians. Maple-Brown et al. (2008) compared results to Tapp et al. (2003) and found Indigenous Australians, after adjusting for age, diabetes duration and height, are at a 1.7 times greater risk than non-Indigenous Australians in developing PN.

Table 1 – Study characteristics and PAD prevalence in those with diabetes

Reference Study Design	Ethnicity Location	PAD Diagnostic Criteria	Number Sampled	NI%	IND%
Davis et al. (2012) Cross-sectional	Indigenous & Non-Indigenous Urban	ABPI <0.9	106 IND & 796 NI	21.5%	30.7%
O'Rourke et al. (2013) Cross-sectional	Indigenous & Non-Indigenous Rural	Data taken from medical records	74 IDN & 69 NI	11.6%	37.8%
Maple-Brown et al. (2008) Cross-sectional	Indigenous Urban	ABPI <0.9	135 IDN	n/a	13%
Tapp et al. (2003) Cross-sectional	Non-Indigenous Urban, rural and remote	ABPI <0.9	821 NI	10.2%	n/a
Abbreviations: PAD, Peripheral arterial disease; ABPI, Ankle brachial pressure index; n/a, Not applicable					

However, Davis et al. (2012) found non-Indigenous Australians with diabetes to have a PN prevalence of 63.3%, and 48.5% for Indigenous Australians. Although Indigenous Australians have a lower prevalence, this could be explained by the non-Indigenous being older within this study sample. While both populations had the same duration of diabetes, the Indigenous Australians were on average fourteen years younger. Given that older age is an independent risk factor for PN (Tapp et al., 2003), the increased age of the non-Indigenous Australians may be the reason for this higher prevalence rate. If these variables were adjusted, like in Maple-Brown et al. (2008), an odds ratio may have shown a higher risk of developing PN in the Indigenous population.

2.2.2 Amputation and Mortality Link

PAD and PN, most often the result of diabetes, are the leading independent precursors to LLA (Charles, 2015). Many studies have reported an association between an increase in mortality rate following a LLA (Reiber, 1996; Mayfield et al., 2001; van Houtum & Lavery, 1996).

There is limited comparative data available on amputation rates in people with diabetes in the Indigenous and non-Indigenous population, with only two cross-sectional studies available. Norman, Schoen, Gurr & Kolybaba (2010) found that minor and major LLAs are 27 and 38 times more likely to occur in the Indigenous population compared to the non-Indigenous population among those aged 25-49 years with diabetes, respectively. O'Rourke et al. (2013) analysed data of 143 people with diabetes requiring a major amputation in Far North Queensland (FNQ). Given that Indigenous Australians only make up 15% of the FNQ population, it is surprising that this group had a higher rate and accounted for 52% of amputations (O'Rourke et al., 2013). Common to both publications is the observation that Indigenous people have a LLA at a younger age than non-Indigenous people.

While there is no figure regarding the mortality rate due to LLA as a result of diabetes, it may be reflected in the life expectancy gap between Indigenous and non-Indigenous Australians. The current life expectancy is 10.6 years and 9.6 years lower for Indigenous males and females, respectively (Australian Bureau of Statistics, 2013). Given that LLAs are more common at a younger age in the Indigenous population, this may contribute to the reduced life expectancy given that post-amputation mortality rates within the first five years are high (Reiber, 1996), leading to early death.

Despite this, LLA rate and early death rate cannot be solely attributed to the increased prevalence of risk factors such as smoking, PAD, and PN within the Indigenous population alone. This is because the magnitude of the prevalence of LLA outweighs the prevalence of risk factors.

2.3 Levels of Evidence

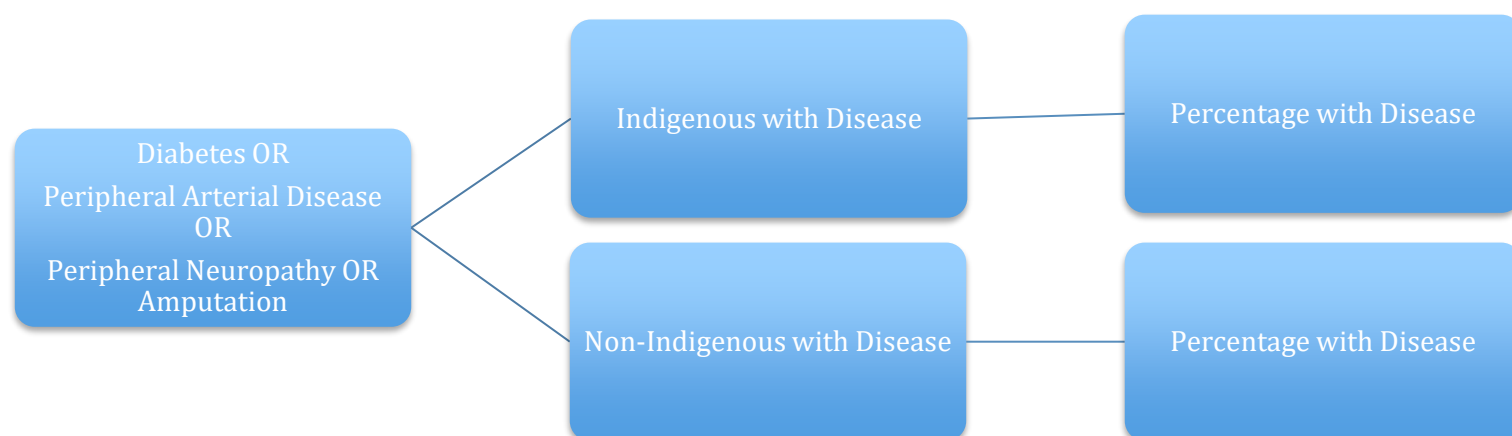
The National Health and Medical Research Council have current guidelines to determine levels of evidence of studies (National Health and Medical Research Council, 2008). However, these guidelines are restrictive for prevalence studies, as these guidelines only lend themselves to determining the level of evidence of intervention, prognostic, aetiological, diagnostic, and screening studies. As a significant aspect of this review is to determine the

gap between the Indigenous and non-Indigenous populations regarding diabetic foot health, the aforementioned studies cannot be assigned a level of evidence with these guidelines.

It is observational studies, particularly cross-sectional, that are required for this aspect of the review as they allow variables like Indigenous status to be correlated with disease outcomes (Figure 1). Cross-sectional studies allow characteristics of a population (Indigenous or non-Indigenous) to be described at a particular point and location in time, and provide a snapshot of the prevalence of disease like diabetes rates, and other variables like PAD, PN and LLA rate in that same location (The Joanna Briggs Institute, 2014). Therefore, observational cross-sectional studies are deemed the most appropriate given the aim of this review.

From the data of these observational studies, the majority of which are cross-sectional in design, a hypothesis can be formulated that diabetes and its LLCs are more common in the Indigenous population compared to the non-Indigenous population. However, it is important to note that none of these studies are able to determine why this may be.

Figure 1.



2.4 Access to Healthcare

It must be examined as to why there is a disparity between Indigenous and non-Indigenous Australians regarding diabetic foot complications. A likely contributor to is the barrier to primary and preventative health care services experienced by many Indigenous Australians. These barriers include the issue of access to culturally sensitive healthcare, and a lack of health education.

2.4.1 Access to Culturally Sensitive Services

Indigenous Australians, particularly those residing in rural and remote communities, face significant challenges to the management of chronic health conditions like diabetes. Unlike non-Indigenous Australians, Indigenous Australians have reported lower rates of use of preventative health services, and higher rates of preventable hospitalisations (Australian Institute of Health and Welfare, 2012).

Evidence suggests that services targeting Indigenous Australians with diabetes would prevent LLCs and improve patient outcomes (Maple-Brown, Brimblecombe, Chisholm & O'Dea, 2004; McDermott et al., 2015). However, a significant barrier to the provision of this is the lack of culturally appropriate and accessible diabetic foot services for Indigenous Australians (WA Department of Health, 2010). While some Aboriginal community-controlled health organisations (ACCHO) offer preventative and screening services for a foot at risk of diabetes complications, they often lack referral pathways to access specialist medical services (Rose et al., 2008; WA Department of Health, 2010). The timeliness of the referral may contribute to Indigenous Australians progressing more quickly towards amputations than non-Indigenous people.

Regions with the highest Indigenous amputation rates like rural and remote communities often lack any podiatric service (WA Department of Health, 2010). Due to this, access to such facilities often require Indigenous Australians to travel vast distances with unfamiliar surroundings and lack of family support, causing apprehension about attending such facilities. This may be why Indigenous Australians reflect higher in preventable hospitalisations and lower rates of preventative health service use, and thus a higher rate of diabetes and its complications. Where access to culturally appropriate services has been made available, Indigenous Australians have shown a positive experience. In an interpretive qualitative study, the majority of the 18 Indigenous Australian participants reported frequent monitoring of diabetes by various health professionals and monthly podiatry visits where access to an ACCHO had been made available (Cuesta-Briand, Saggars & McManus, 2010). However, this study is hard to generalise given it only included 18 participants.

Overall however, to improve podiatric healthcare access, these services need to be not only accessible in location, but also delivered with respect to the cultural needs of the Indigenous population, as they have been shown to be utilised. But to improve patient outcomes, referral pathways between health practitioners must be utilised with the appropriate patient support to improve the management of diabetic LLCs.

2.4.2 Education

Many Indigenous Australians have not had the same access to health education as non-Indigenous Australians (Marmot, 2011). Where education has been available, it can be complicated by language differences and cultural misunderstanding (Garro, 2000). Appropriate, culturally sensitive education can reduce diabetes complications significantly by improving self-care behaviour (Edmonds, van Acker & Foster, 1996; Viswanathan, Madhavan, Rajasekar, Chamukuttan & Ambady, 2005). Those with a lack of diabetes and foot care education compared to those who have had formal education have been identified as having a three to four-fold increase of LLCs and LLAs (Nicolucci et al., 1996).

A lack of education in the Indigenous population has evidently affected the importance of foot care given amputation rates within this population. Bruce, Davis, Cull & Davis (2003) found subjects who were Indigenous Australian to have a significantly lower knowledge of diabetes and were less like to have received diabetes education. It concluded barriers to education included access, and utilisation, potentially due to it being culturally

inappropriate. However, where available, diabetes education is likely to benefit from a specialised program, and in the case of this review, a diabetic foot educational program tailored to this population group.

Culturally sensitive diabetes education has shown positive outcomes in foot care knowledge and self-reported patient behaviour, leading to a reduction in amputation rates. This was seen in an intervention study of Native Americans, a population with a high prevalence of diabetes, similar to Indigenous Australians (Rith-Najarian et al., 1998). This study saw a 25% reduction in amputation rates just via education alone. Similar strategies employed to the Australian Indigenous population is likely to see an improvement in diabetic foot outcomes.

However, in an Australian quantitative study, of the 96% of Indigenous participants with diabetes, only 35% had a foot check in the previous 12 months. This may indicate a lack of perceived need and understanding for foot care in preventing diabetic LLCs. Cuesta-Briand et al. (2014) enhanced this idea by showing that perceived need for podiatrists can be low, likely due to the low level of awareness and education of foot care importance in diabetes, particularly in the low socioeconomic Indigenous population.

In the Torres Strait Islands and Northern Peninsula Area, participants had a high level of awareness regarding foot care (Wong, Haswell-Elkins, Tamwoy, McDermott & d'Abbs, 2005), likely due to common and visible diabetes-related LLCs in the Torres Strait. This may have created fear resulting in the reported higher rates of foot checks. Despite this, a lack of accessible foot care education regarding the self-care of the feet remained according to participants of this study. This is further indicated given that participants regarded poor education in self-care as a reason for requiring amputation.

Diabetes and foot care education in the Indigenous population is therefore required to assist in the prevention of LLCs for those with diabetes. However, to increase the perceived importance of foot care, and improve patient behaviour, the education must be designed in a manner that is culturally appropriate for it to be effective.

3.1 Conclusion

Current research points to the health inequalities and inequities experienced by Indigenous Australians compared to non-Indigenous Australians regarding diabetes and the lower-limb. However, these diabetic LLCs do not stem just via the higher prevalence of diabetes, otherwise there would not be such a gap in amputation rates. The difference in education and access to service has clearly impacted these statistics, negatively for Indigenous Australians. This is despite the literature highlighting the importance of providing accessible, culturally sensitive education and services, in reducing diabetes-related LLCs, and ultimately the life expectancy gap. By addressing the lack of access, we may see a reduction in the gap between Indigenous and non-Indigenous Australians.