Description of Total Population Hospital Admissions for Morton's Metatarsalgia in Australia

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Background: Morton's metatarsalgia is a painful perineural fibroma of a plantar nerve, most commonly of the second or third intermetatarsal spaces of the forefoot. The aim of this study was to investigate hospital admissions with a diagnosis of Morton's metatarsalgia in the Australian population from 1998 to 2008.

Methods: Data regarding admissions with a diagnosis code of ICD-10 G57.6 were extracted from the Australian Institute of Health and Welfare databases of hospital morbidity from 1998 to 2008. The event of interest was an admission with ICD-10 G57.6 (Morton's metatarsalgia). The explanatory variables included sex and age group. Rates were calculated using the estimated resident population counts to determine denominators.

Results: Morton's metatarsalgia admissions were almost three-fold higher for women in the population compared to men. The rate of admissions for Morton's metatarsalgia was the highest for the total population in the 55- to 59-year-old age group. Among women admitted for Morton's metatarsalgia, the highest rate was in the 50- to 54-year-old age group; among men, the highest rate was in the slightly older 55- to 59-year-old age category.

Conclusions: Population-level information on admissions for Morton's metatarsalgia show that admissions were three times higher among women compared to men. The highest admission rate was in the 50- to 55-year-old age group. (J Am Podiatr Med Assoc 104(5): 451-454, 2014)

Morton's metatarsalgia (also known as Morton's neuroma, interdigital neuritis, and neuralgia) is a painful condition in the plantar aspect of the forefoot attributed to the thickening and fibrosis of the common digital nerve at the level of the bifurcation into common digital branches.[1-7] Many sources report that this condition is more common in the second and third interspaces of the foot. Footwear seems to play a role in the formation of Morton's metatarsalgia in susceptible individuals,[3,5] and the condition is said to affect mostly women who wear high-heeled shoes.[4] The etiology of this condition is still unclear. The perineural tissue surrounding the nerve becomes enlarged and thickened, possibly as a result of factors such as a trauma, compression from the deep transverse metatarsal ligament, metatarsus proximus, and abnormal pressure.[1-5] The pain often radiates to the toes in the form of tingling and numbness, and most people describe the pain as "walking on a pebble." The literature indicates that it is more common in women, but men are also affected by this malady.[1-3,7] The condition is treated conservatively by changing shoe gear, and by using metatarsal padding, orthosis, cortisone, or alcohol injections. Failure to respond to conservative care may necessitate surgical excision of the affected nerve.

There is a dearth of epidemiological data regarding hospital admissions for Morton's metatarsalgia internationally. The purpose of this article is to describe the epidemiology of hospital admissions for Morton's metatarsalgia in Australia, including the description of admissions by patient sex and age group, using International Classification of Diseases, 10th Revision (ICD-10) diagnosis codes.

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Methods

We extracted data on Morton's metatarsalgia admission to public and private hospitals across all Australian states and territories from the Australian Institute of Health and Welfare online database from 1998 to 2008.[8] Individual-level data were not available. The data have been recorded based on standardized International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10).[9] The ICD-10 code of G57.6 corresponds to Morton's metatarsalgia. The factors extracted from the online data were total number of admissions, age, sex, and age groups of patients admitted with an ICD-10 code of G57.6. The male-to-female ratio and percentage of admissions within each age group were determined.

The ICD-10 code G57.6 was used to allow the investigators to look at admissions for this disorder using the Australian Institute of Health and Welfare (AIHW) data.[8] The AIHW is an Australian Government organization that provides information and statistics on Australian health and welfare matters.

Estimated resident population counts of all sociodemographic stratifications for 1998 to 2008 were available from the Australian Bureau of Statistics.[10] Rates were generated by dividing the number of hospital admissions of Morton's metatarsalgia by the estimated resident population of the same specified group and multiplying by 100,000 to determine the number of hospital admissions per 100,000 people per year. The rates for 3 years (1998, 2001, and 2004) were calculated to observe the variation over time. The standard error formula for rates was used to derive standard errors and consequent 95% confidence intervals. Findings were considered significant at the $P < 0.05$ level.[11] We used publicly available raw data and received approval for this project from the Human Research Ethics Committee of the University of Western Australia.

Results

There were 13,579 hospital admissions with a diagnosis of Morton's metatarsalgia from 1998 to 2008 (Table 1); 3,266 patients were male and 10,313 were female. The average female-to-male ratio was 3.2 to 1.0. The highest rates of admission for Morton's metatarsalgia among women were in the 50- to 54-year-old age group; for men, the highest admission rates were in the 55- to 59-year-old age group (Fig. 1). The highest rate for women was in 2001 at 10.92 and for men in 1998 at 4.01 per 100,000 populations per year (Table 2). Over the period reviewed, the highest overall rate for the total population study from 1998 to 2008 occurred in 1998 at 7.43 per 100,000 population. The rates for every age group for the years 1998, 2001, and 2004 were determined (Table 1). The highest rate in 1998 was in the 55- to 59-year-old age category at 22.10 per 100,000; in 2001, the highest rate was in the 60- to 64-year-old category at 23.60 per 100,000; and in 2004, the highest rate was in the 55- to 59-year-old age category at 21.54 per 100,000. The rates for each of these 3 years varied slightly; however, the female-to-male ratio remained constant at approximately 3 to 1.

Discussion

Although a number of studies have investigated the outcome of surgery on patients with Morton's metatarsalgia, previous studies have not used population data. Bradley et al[12] found from 85 individuals who underwent Morton's neuroma surgery, there were 71 females and 14 males (ratio of 5 to 1). In a 1979 study, Gauthier[13] sectioned the deep transverse intermetatarsal ligament of 206 individuals, 187 females and 19 males, with a ratio of approximately 10 to 1. Other ratios of female to male who have had surgery for Morton's metatarsalgia have been reported in the literature[12-14]; however, no study to date has reviewed large sample sizes that may reflect the whole general population of a particular country.

In 2006, Latinovis et al[15] studied data on the incidence of common compressive neuropathies from 253 general medical practices across the United Kingdom. Morton's metatarsalgia was found to be more common in women, and in both men and women between 55 and 64 years of age, which is similar to our findings; the male-to-female ratio was 1.8 to 1.0. They also studied the rate of the operative treatment and found a 2.3 to 1.0 female-to-male ratio, which is also very close to our results. Their study, however, was based on number of general practitioner practices across the United Kingdom and does not necessarily resemble the total population.

Limitations of the Study

Although our study has the benefit of using total population data for Australia, the use of administrative data is a limitation in that the quality of the results depends on the accuracy of the data. This

Table 1. Age Group, Total Number of Admissions, Percent of Admissions, and the Rates per Year per 100,000 Populations for the Years 1998, 2001, and 2004

Age Group	Total No. Admissions (1998–2008)	Total % Admissions	Rate 1998	Rate 2001	Rate 2004	Mean Rate	95% CI
1–19	62	0.45	1.41	0	0.22	0.54	0–2.03
20–24	157	1.16	2.34	1.46	0.57	1.46	0–3.19
25–29	345	2.54	3.69	2.84	1.99	2.84	1.17–4.50
30–34	603	4.44	4.39	6.34	3.41	4.71	1.79–7.64
35–39	1,031	7.59	7.81	8.11	6.01	7.31	5.08–9.53
40–44	1,204	8.87	9.02	8.31	6.35	7.89	5.18–10.61
45–49	1,660	12.22	12.68	13.32	11.97	12.66	11.33–13.99
50–54	2,267	16.69	20.01	18.53	14.90	17.81	12.67–22.96
55–59	2,258	16.63	22.10	19.53	21.54	21.05	18.41–23.70
60–64	1,743	12.84	19.48	23.60	19.70	20.93	16.38–25.47
65–69	1,075	7.92	17.68	12.75	17.18	15.87	10.55–21.19
70–74	672	4.95	12.75	9.24	9.90	10.63	6.97–14.29
75–79	338	2.49	6.60	8.86	6.98	7.48	5.11–9.85
80–84	140	2.49	4.10	4.85	4.44	4.46	3.73–5.20
85+	24	1.03	0.44	0.75	1.38	0.86	0.09–1.63
Male	3,266	0.18					
Female	10,313	24.05					
Total	13,579	75.95					

study reflects the rate of admission of only patients diagnosed with Morton's metatarsalgia across Australia, who were admitted to public and private hospitals presumably for surgical management of the condition by both podiatric and orthopedic surgeons. It does not represent all patients diagnosed with Morton's metatarsalgia in private or public clinics and hence does not represent the true incidence in the population and is likely to be an underestimate of total morbidity. However, the hospital admission information is important to determine the need for services and estimating the cost of admissions relating to Morton's metatarsalgia.

Another limitation is the variation in definition of the code G57.6. The ICD-10 defines G57.6 as

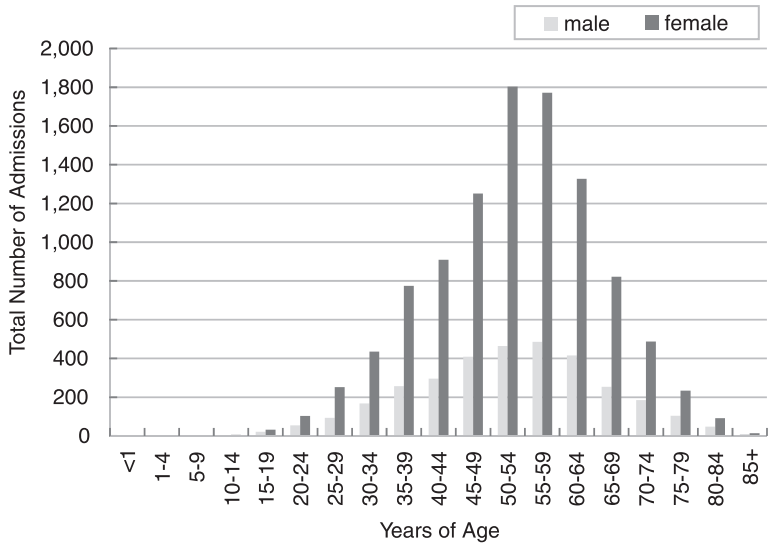

Figure 1. Number of admissions for Morton's metatarsalgia among men and women by age group in years.

Table 2. Rates for 1998 to 2008 Male and Female (Admissions per 100,000 per Year)

Years[a]	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008
Rates, male	4.01	3.32	3.4	3.63	3.37	3.01	2.93	2.84	3.46	3.24
Rates, female	10.81	10.06	10.46	10.92	9.90	9.64	10.65	10.13	10.38	10.47
Total	7.43	6.71	6.89	7.30	6.66	6.36	6.82	6.51	6.94	6.88

[a]Years represent Australian financial years July 1 to June 30.

Morton's metatarsalgia while the Australian Institute of Health and Welfare defines G57.6 as the lesion of the plantar nerve.[8] Another limitation is that we assume most people will have only one admission and that they are not readmitted for recurrent Morton's metatarsalgia or any other complications relating to this pathology. In our experience, the most common plantar nerve lesion or pathology is Morton's metatarsalgia (a.k.a. Morton's neuroma, and interdigital neuralgia).

Conclusions

This article has provided analysis of total population data for Morton's metatarsalgia in Australia using the Australian Institute of Health and Welfare databases of hospital morbidity from 1998 to 2008. Such data are useful for morbidity and cost estimates. Although somewhat complex to access and manage, these data are publically available and can be used to follow the trends for this disorder. From the results, we see that the rate of Morton's metatarsalgia admission is three times more common in women and has the highest admission rate in the 50- to 55-year old category at 10.9 per 100,000 of population.

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