

Foot health and mobility in people with intellectual disabilities

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Abstract

Foot disorders affect people with intellectual disabilities and have an impact on their ability to mobilise in the community. The prevalence of foot disorders appears to be higher than in the general population. Foot problems are recognised as part of certain syndromes associated with intellectual disabilities. The Special Olympics has highlighted the increased prevalence and the nature of foot problems among athletes. The issues in the development of foot problems are related to knowledge among carers and people with ID of foot problems. The important issues in the management of foot problems include awareness by carers and podiatrists of foot disorders in people with intellectual disabilities, effective communication with the person, and the assessment of mental capacity by podiatrists when proposing interventions to manage the problems. Maintaining a person's mobility through active attention to their foot health has benefits not just for the person but their access to community life and reduced costs in meeting their health needs.

Keywords: podiatry, foot, intellectual disabilities, Down syndrome

Introduction

Feet are essential to an ability to mobilise independently or with support. The ability to mobilise without aid changes with age because muscles, bones, and ligaments weaken predisposing to injury and periods of immobility. For some people however, independent mobility is not always possible because of physical disorders or lower limb deformities. Lifelong attention to the health status of feet is important in order to treat foot disorders, relieve discomfort, and maintain good general health. Intellectual disability (ID) is associated with poorer health status and outcomes than in the general population (Cooper, Melville, & Morrison, 2004). Michael (2008) in the UK highlighted the health inequalities that affect people with ID and encouraged health care practitioners to consider their health needs when working with people with ID. Emerson and Baines (2012) report on the health inequalities affecting people with ID. Health inequalities are not only evident in the UK but are prevalent internationally (Lin, Wu, & Lee, 2003) illustrating the commonality of health problems among people with ID. This paper includes a review of the literature on foot problems in people with ID using the MESH terms podiatry, foot, intellectual disability and Down Syndrome. The databases Medline and PsychInfo were accessed. The authors describe common foot disorders, and discuss relevant issues in the management of foot disorders in people with ID.

Foot disorders and intellectual disabilities

Foot health is characterised by a good blood circulation, absence of infection or inflammation, well-functioning sensation, and healthy skin and nails that allow the foot to be used when mobilising. Dysfunctions of the foot arise with abnormalities in structure, connective tissues, circulation, and the nerves supplying the foot. Even where the person cannot use the foot to mobilise, healthy tissues are important to prevent disease and avoid pain.

Foot health is affected by many factors that include general physical health, diseases of the foot, and physical activity to help maintain tone and give strength to feet. Common health problems relevant to the foot include diabetes mellitus and peripheral vascular disease that predispose to poor circulation to the lower limbs that could lead to ulcer formation, infection, and disability. Specific disorders of the foot include bony abnormalities such as clubfoot or hallux valgus (bunion formation). The shape of the foot is maintained by bones and the connecting tissues of ligaments and small muscles. Laxity of these structures can lead to flatfoot but physical activity helps to strengthen the ligaments and muscles and therefore enhance mobility.

In a population sample in the UK considering foot disorders and disability, 63% of respondents reported disorders of the foot and 10% complained of foot pain (Garrow, Silman, & Macfarlane, 2004). Molgaard, Lundbye-Christensen, & Simonsen, (2010) detected a prevalence rate of foot pain of 30.4% in a Danish sample. Hill, Gill, Menz, & Taylor, (2008) in Adelaide, Australia reported on a sample in the general population where 17% experienced foot pain. Disorders of the foot are especially common in people with diabetes mellitus presenting with ulceration of the skin, infections, sensory impairments, and pain. Walters, Gatling, Mullee, & Hill, (1992) found a prevalence of foot ulceration of 7.4% in people with diabetes mellitus compared with 2.5% without the disease. In Scotland, Leese, Stang, Mcknight, & Scottish Diabetes Foot Action Group, (2011) reported the incidence of foot ulceration among people with diabetes was 2.5% highlighting the effect of diabetic complications on feet and their potential impact on the function of the foot.

The prevalence of foot disorders in people with ID is uncertain because of few epidemiological studies. Cooper (1998) reported higher rates of physical health problems including immobility and arthritis among a group of adults with ID over 65 years compared with a younger group of adults with ID. Fractures of the extremities are more common among mobile adults with ID compared with non-weight bearing, non-ambulant adults who

experience more fractures of the long bones such as the femur (Glick, Fischer, Heisey, Levenson, & Mann, 2005). Fractures of the bones of the foot increase with age as bones become more decalcified suggesting that weight-bearing is important in enhancing bone density and thus reduce the risk of long bone fracture.

Disorders of the foot are associated with certain syndromes that are more common in people with ID for example, Down syndrome. People who do not have syndromic disorders have more foot problems than would be found among the general population (Prasher, Robinson, Krishnan, & Chung, 1995). Ill fitting footwear and poor foot hygiene are important contributors to poor foot health by causing pressure on the foot or facilitating infections to develop on the skin (Jenkins, Cooper, O'Connor, Watanabe, & Wills, 2011). In a community survey on access to health services by people with ID, Lennox, Nadkarni, Moffat, & Robertson, (2003) found foot disorders and mobility problems among 50% of subjects. In the survey 72% of people had known foot disorders that had not been assessed by a podiatrist. This raises an issue of access to healthcare in general and especially to foot care services.

The Special Olympics (SO) has provided opportunities for assessments of the health of people with ID highlighting the prevalence of foot disorders even among Special Olympians. The causes of the most common foot problems are lax ligaments, abnormal gait and movement, and skin conditions due to poor hygiene and ill-fitting footwear (Jenkins et al., 2011). Among Special Olympians with Down Syndrome the ankle joint was the second most common joint injury (Batts, Glorioso, & Williams, 1998). The Fit Feet programme of the Special Olympics prospectively collects data on the foot health of competing athletes at the SO events indicating that foot and ankle problems have a direct effect on performance. Conventional sports footwear is not always appropriate to the shape of athletes' feet that can lead to injury and disability (Special Olympics 2006). Appropriate training is important for athletes when preparing for competitions in order to avoid injury (Platt, 2001).

Syndromic disorders and the foot

Genetic or chromosomal syndromes associated with intellectual disabilities can have effects on foot health either directly, where foot anatomy is altered or neuropathy is a feature of the syndrome (Smith Magenis Syndrome), or indirectly where the consequences of lifestyle factors for example, obesity (Prader Willi Syndrome), have an impact on the foot. Three syndromes are considered because of their associations with foot disorders.

Down syndrome

Down syndrome (DS) is the commonest chromosomal disorder among people with intellectual disability. Foot disorders in people with Down syndrome are more common when compared with people without DS (Prasher et al., 1995). The common foot disorders in DS are pes planus (flat feet) and abnormal pressure prints. The causative factors are related to laxity of the muscles and ligaments of the foot. Concolino, Pasquizzi, Capalbo, Sinopoli, & Strisciuglio, (2006) found a high prevalence of foot disorders among 50 children compared with children without DS and recommended the importance of regular podiatric assessment. These findings were supported by Mik, Gholve, Scher, Widmann, & Green, (2008) who estimated that 20% of all children with Down syndrome have orthopaedic problems that include foot disorders. Flatfoot in DS is common and can directly affect a person's mobility especially as they grow older since people with DS appear to age earlier (Smith & Ulrich, 2008).

Prader-Willi syndrome (PWS)

Prader-Willi syndrome (PWS) is a genetic disorder of chromosome 15 (Prader, Labhart, & Willi, 1956). Small feet, less than the tenth percentile for height age, is recognised as a minor criterion in the consensus diagnostic criteria for PWS (Holm, Cassidy, & Butler, 1993). Among 36 adults with PWS, kyphoscoliosis, a disorder of the spine, was associated with foot abnormalities and limb mal-alignment of the foot suggesting that full orthopaedic

assessments should be carried out in adults with PWS (Shim, Lee, Seo, Koo, & Jin, 2010). Hudgins and Cassidy (1991) reported that foot length in adults with PWS is proportionately smaller than hand length and Eiholzer et al., (2009) demonstrated that growth hormone treatment over six years did not increase foot length in children with PWS.

Smith Magenis Syndrome (SMS)

Smith Magenis Syndrome is a genetic disorder of chromosome 17 that has well described physical health difficulties including foot disorders (Smith et al., 1986). Spilsbury and Mohanty (2003) reported on the orthopaedic characteristics of adults with SMS that included flat feet, short toes, and poor walking ability. People with SMS have decreased sensation of their extremities and are at risk of injury to the feet that could lead to ulceration of the foot. Attention to the peripheral nervous system is important when caring for people with SMS to avoid injury by advising on wearing appropriate footwear to minimise the occurrence of pressure sores.

Managing foot disorders in people with ID

The management of foot disorders in people with ID can be difficult because of factors associated with the person, the cause of the intellectual disability, and their carers. Knowledge of these is important to the practitioner in achieving successful positive outcomes in the foot health of the person. Such factors include, gait management, footwear, and effective communication with the person.

Footwear

Prasher et al., (1995) highlighted the importance of appropriate footwear for children with Down syndrome (DS) who require wider shoes because of the shape of their feet.

Selby-Silverstein, Hillstrom, & Palisano, (2001) described the benefit of foot orthoses in children with DS by decreasing heel eversion when standing and walking. On account of the inherent foot shapes of adults with DS, standard sports footwear does not always fit the feet

of Special Olympic athletes with DS that can cause tendonitis, blisters, and sensory injuries (Tanji, 1991). Platt (2001) emphasised the importance of appropriate footwear in Special Olympians to avoid foot and ankle injuries. Where 'off the shelf' trainers or shoes are not suitable, musculoskeletal assessment by a podiatrist and orthotist may be appropriate.

Gait

Gait is the movement pattern that a person uses when mobilising either walking or running. Agiovlasis, Yun, Pavol, McCubbin, & Kim (2008) compared transition speeds from walking to running between adults with ID and a group without ID. The results indicated that people with ID are slower in changing from walking to running. Plantar pressures can be measured using pressure analysis equipment and bespoke orthotics fitted to avoid damage to tissues caused by excessive pressure on the joints and soft tissues. This can have a positive effect on the person's gait pattern and reduce foot problems for example pain and strain, and reduce the risk of falling. As people grow older, disorders of gait and movement are more common and interventions to promote stability should help to improve and maintain optimal mobility in adults with Down Syndrome (Smith & Ulrich, 2008).

Communication

The podiatric therapies offered to people with ID are the same as for other people and should follow recommended guidelines for example, in diabetic foot care (NICE 2004). Special attention by the podiatrist to the intellectual disability of the person is required to achieve good outcomes because of problems in understanding information given to them by others. People with ID have different communication abilities that podiatrists need to be sensitive to. Learning about the communication abilities of the person can be time well spent that should enhance adherence to treatment plans. Presenting information in a format that the person understands and using pictorial materials can be effective in helping to achieve good outcomes. Communication materials in appropriate formats are freely available for use with people who have communication difficulties (www.easyhealth.org.uk). People with ID

often rely on carers to be aware of their health needs who in turn might not be informed on disease presentation and the risks of not adhering to treatment plans. For this reason, education of carers and their involvement in managing foot care is crucial in helping to maintain the person's independence and mobility.

Mental capacity

Kent and King (2011) highlight the importance of assessing mental capacity in adults with ID when podiatrists propose interventions as part of their podiatric management plan. All interventions recommended by podiatrists require the consent of the person regardless of the level of invasion of the intervention. For this reason, presenting information in a format that people with ID can understand is essential to enhance their capacity to take informed decisions on their foot health. Such methods require skill and time in order to be successful but with the help of carers and specialists in communication methods, podiatrists can achieve good outcomes in foot care.

Mobility among people with ID

Maintaining the mobility of people with ID is important because those with poor mobility have greater care needs and increased care costs than people who are active and mobile (Cleaver, Ouellette-Kuntz, & Hunter, 2009). Maintaining and enhancing mobility has added benefits to the general health of the person and the quality of life that they enjoy. Access to transport systems has health and social benefits to people with ID. Valuing People Now (2009) in the UK promotes the facilitation of community access for adults with ID. Providers of transport are encouraged to assess the accessibility of their vehicles and transport systems for adults with ID. Audit standards against which transport systems can be measured include facilities for wheelchair users.

Future

Further research on foot problems in people with ID is required to understand the

prevalence of foot disorders, their characteristics, and the application of effective treatments tailored to the needs of people with ID. It will be important to learn what factors in the lives of people with ID contribute to the development of foot disorders and how they can be supported to avail of current treatments. Access to podiatric services has been highlighted and understanding the barriers to care for people with ID is an important area for investigation. Mental capacity is essential in gaining consent and enhancing adherence to management, and thus further exploration of methods to enhance mental capacity of people with ID on foot disorders is required. Promoting good foot health among people with ID considering the health risks they currently experience depends on podiatrists and carers recognising foot disorders and their presentation in people with ID. In this way, mobility can be maintained or improved that would contribute to better health outcomes for people with ID.

Conclusion

Foot problems are common from childhood to adulthood among people with ID. Bony deformities of the foot, general health disorders, musculoskeletal disorders and inappropriate footwear contribute to the development of foot disorders. People with ID do not have good access to podiatric services even when foot problems are well-known. People with syndromic disorders have a high prevalence of foot disorders often because of lax muscles and ligaments in the foot. To effectively manage foot disorders in people with ID, good communication with the person is essential to help understanding and adherence to treatment plans. Attention to a person's foot health has important benefits to their health, social functioning and mobility.

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