key points

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The greatest proportional increase in the number of people with diabetes by age group is predicted to occur in those aged 60 to 79. In older people living with diabetes, geriatric syndromes, which indicate frailty, are emerging as a third category of complications in addition to the traditional microvascular and macrovascular sequelae.

Frailty is defined by the presence of three or more phenotypes (weight loss, weakness, decreased physical activity, exhaustion and slow gait speed). The presence of one or two phenotypes describes a pre-frail state, and the absence of phenotypes describes a non-frail person. Sarcopenia, or loss of muscle mass, is the muscular manifestation of frailty phenotype and is defined as a generalised loss of skeletal muscle mass and strength that leads to low physical performance.

Persistent hyperglycaemia associated with diabetes increases the production of advanced glycation end products that accumulate in the muscle and cartilage causing muscular stiffness and reduced muscle function. Peripheral neuropathy and reduction in motor neurons is another cause of sarcopenia in diabetes. Patients with peripheral neuropathy have a greater calf intermuscular adipose tissue volume which has been shown to be associated with poor muscle strength and function.

Persistent hyperglycaemia has been shown to be associated with poor muscle quality, performance and strength independent of age, race, sex, weight, height and physical activity. The coexistence of dementia and diabetes also increases the risk of frailty. There is evidence that midlife behaviours such as smoking, alcohol consumption, poor diet and low levels of physical activity are associated with frailty and dementia in later life.

Frailty is a dynamic condition which can worsen or improve over time. Patients may progress from a non-frail to pre-frail or frail state. There is evidence that, with timely intervention, there is a greater chance for an individual to recover from pre-frail to non-frail than to deteriorate into frailty. The progression of frailty is likely to be multifactorial, therefore multimodal intervention, including maintenance of adequate nutrition, physical exercise, and glycaemic control, may help to delay or prevent the development of frailty and to improve outcomes.

Adequate nutrition is essential for protection against the development of frailty. Muscular protein synthesis diminishes with increasing age, therefore older people will need more dietary protein to compensate for this anabolic resistance. Vitamin D levels < 15 ng/ml have been shown to be associated with pre-frailty and frailty. There is no specific medication at present for the prevention of frailty but it should be noted that hypoglycaemic medications have varying effect on muscle function and should be reviewed. Frailty and sarcopenia should be identified during the annual review of older people with diabetes.