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extra care required
Anne Phillips, University of York, and Steve Phillips, University of Huddersfield, review current literature addressing the risks of diabetes, undiagnosed diabetes, cognitive decline and hypoglycaemia in older people and the need for individualised care.

guidelines for managing older people with diabetes
The McKellar Guidelines for Managing Older People with Diabetes in Residential and other Care Settings were developed to help clinicians deliver optimal evidence-based diabetes care for older people in all care settings.

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Diabetes is a condition relevant to all age groups, however as we grow older the risk of diabetes increases and management of the condition may need to change.

Older people account for 35% of all cases of diabetes and the majority of the over 60 age group have type 2 diabetes. We should be aware that this is a leading underlying cause of disability and death in older people and those with diabetes are more likely to have comorbidities affecting their quality of life.

In our lead article it is noted that diabetes care for older people is frequently sub-optimal and it is recognised that care should be individualised for people with both type 1 and type 2 diabetes to maintain safety, reduce risk and avoid preventable complications such as hypoglycaemia (low blood sugar). Anne Phillips and Steve Phillips, review the current literature and highlight the risks of diabetes, undiagnosed diabetes, cognitive decline and hypoglycaemia in older people and explain the need for individualised care.

As one in four older people in care homes have diabetes and those living in care homes may be more likely to be admitted to hospital when they are unwell, Prof Trisha Dunning introduces The McKellar Guidelines for Managing Older People with Diabetes in Residential and other Care Settings. These Guidelines have been developed to help clinicians deliver optimal evidence-based diabetes care for older people in all care settings.

Nutrition and dehydration are also important factors to consider. People with diabetes are at increased risk of dehydration. Fluid intake is often lower in older people and this can lead to dehydration, particularly during illness where blood glucose levels can also rise quickly. Dehydration is a condition relevant to all older people, it is associated with increased mortality, disability and longer hospital stays and it is important to support all older people to drink well.

There is lots to think about in this issue and it gives us all pause for thought when we think about the diagnosis and management of diabetes.

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Diabetes – extra care required

Anne Phillips is a registered nurse with a background in community care as a District Nurse prior to working as a Diabetes Specialist Nurse, both in London and in Yorkshire. Anne joined the University of York in 2000 and has developed a portfolio of educational opportunities for practitioners in many areas of diabetes care. She also volunteers for Diabetes UK. In 2014, Anne won the Quality in Care and Diabetes UK award for Outstanding Educator in Diabetes and has published over 60 times regarding diabetes care. She is passionate about diabetes education for practitioners and every person living with diabetes.

Steve Phillips is a registered nurse with experience working in the speciality of caring for the older person, in acute, rehabilitation and continuing care. He worked in West London as a district nurse specialising in leg ulcer and continence management. Steve then moved into the education sector at the University of Nottingham, focusing on older person studies, leg ulcer management and tissue viability. Steve now works at the University of Huddersfield, as course leader for the MSc Community Nursing Practice (District Nursing) course.

Introduction

Diabetes is an increasingly prevalent condition across all age groups with 415 million people known to be already diagnosed across the world (International Diabetes Federation (IDF), 2015). Diabetes risk increases with age and over the age of 65 years the numbers are increasing significantly. However the IDF, in their 2013 Managing Older People with Type 2 Diabetes Global Guideline (Sinclair et al., 2015), recognised that the care for older people was frequently sub-optimal and that diabetes care should be individualised.

This concept of individualised care is a key feature of the recently published NICE guidance for people with type 1 and type 2 diabetes [NICE NG28 and NICE NG17 (2015)], the updated recommendations of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) (Inzucchi et al., 2015). Whilst this concept offers flexibility for practitioners working with older people with diabetes, it also focuses on care approaches to maintain safety, reduce risk and avoid preventable complications such as hypoglycaemia (low blood sugar).

Risks of diabetes

Older people with diabetes have significant risk from cardiovascular disease. However, targeting hypertension and dyslipidaemia in older people can be problematic if complicated with insulin resistance, inflammation, autonomic dysfunction and diminished vascular responsiveness (Halter et al., 2014). Additionally, sarcopenia, which is a generalised loss of skeletal muscle mass and strength, is linked to frailty, which affects about 25% of older people with diabetes (Sinclair et al., 2013). Increased frailty leads to increased dependence and as such requires knowledgeable caregiving regarding diabetes management and risk reduction, especially from hypoglycaemia. This is a key theme through the 2015 NICE guidance’s and the ADA and EASD recommendations (Inzucchi et al., 2015).

Undiagnosed diabetes

It is estimated that over 13,500 older people living in residential care have undiagnosed diabetes (Phillips and Phillips, 2011). It is recommended that every resident within nursing and residential care is screened for diabetes on admission and then every two years thereafter (Diabetes UK, 2010).
However, only 25% of care facilities undertake regular screening for diabetes. Insulin sensitivity declines with age and symptoms of undiagnosed diabetes can be missed. For example, abnormal glucose tolerance is present in about 60% of adults over 60 years of age (Narendran et al., 2014).

Older people with type 2 diabetes may not present with usual symptoms, as such polyuria (frequent urination) polydipsia (excessive thirst) and polyphagia (increased appetite), may be masked. Additionally, as the renal threshold for glucose increases with age, glycosuria may not be detected (Sinclair et al., 2013). Initial presentation could be dehydration with altered thirst perception and delayed fluid supplementation. The person may experience dry eyes, a dry mouth and confusion due to declining cognitive function, dehydration and/or constipation and incontinence due to hyperglycaemia. These all represent typical presentations of undiagnosed diabetes in older people and these triggers should encourage carers and practitioners to consider screening for diabetes (Phillips and Phillips, 2011). Additionally, an increased risk of bone fracture and increased frailty is linked to having diabetes so a review of these factors is important.

Cognitive decline
Diabetes is associated with cognitive change and increasingly accelerated dementia (Tomlin and Sinclair, 2016). Specific cognitive changes include a reduced verbal memory and psychomotor function (Kodl and Seaquist, 2008). Practitioners and carers should recognise that the self-management of diabetes requires a number of cognitive reasoning and decision making skills, especially in relation to blood glucose management, processing of information, attention to planning and calculation (Tomlin and Sinclair, 2016). Consequently, regular review and a reduction in required decision making by reducing polypharmacy is a safe approach.

Depression is also more common in diabetes and this can exacerbate or be mistaken for signs of mild cognitive decline. Being depressed can influence self-management abilities and can decrease motivation to self-care (Feil et al., 2009).

To reduce risk and promote individuality in diabetes management, attention should be focussed on minimising risk and on individual reassessment of everyone with diabetes at every review [IDF (2013), NICE NG28 and NG17 (2015) and the ADA and EASD (Inzucchi et al., 2015)]. This avoids unnecessary medications which may no longer work, aiming to reduce polypharmacy which can increase the risk of confusion and hypoglycaemia if the individual is prescribed a glucose lowering medication.

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Hypoglycaemia

Hypoglycaemia is one of the most common complications occurring in people with type 1 and type 2 diabetes in residential and nursing home care (Abdelhafiz and Sinclair, 2009). Hypoglycaemia can cause serious morbidity in older people and evidence has recognised that hypoglycaemia can trigger major vascular events such as myocardial infarction, strokes, acute heart failure and life threatening ventricular arrhythmias (Nilsson, 2011).

Signs and symptoms of hypoglycaemia may be mistaken in older people. This is because increasing age can reduce the signs, due to the fact older people have decreased counter-regulatory response (Frier and Fisher, 2007) and the individual concerned may not have capacity or may lack awareness of their symptoms (Cryer et al., 2003). Additionally, hypoglycaemia may present as a neurological problem with light-headedness and unsteadiness with increased risk of falling. This can be misinterpreted as features of cerebrovascular disease (Abdelhafiz and Sinclair, 2009).

Additionally, if the older person with diabetes is experiencing dementia, their risks for experiencing severe hypoglycaemia are significantly increased (Yaffe et al., 2013). If the older person does not have dementia but has diabetes and they experience a severe hypo then their subsequent risk of developing dementia is increased (Yaffe et al., 2013). Thereby, hypoglycaemia avoidance is the optimal approach in older people’s care.

Conclusion

The prevalence of people with diabetes is growing exponentially with 1 in 11 people currently known to be diagnosed across the world (IDF, 2015). We are therefore facing a diagnosed predicted prevalence of over 642 million people living with diabetes in the next 25 years. We consequently need to act smarter and be proactive in reducing risks in diabetes care and promoting best management strategies across all age groups. Individualised care is the key approach being advocated by all the latest UK and international guidance for diabetes care. This is particularly important and suggests that diabetics require extra care and regular review to maintain their safety and enable them to lead their lives with minimal risk of complication from anti-diabetes treatments.

References

The McKellar Guidelines: Can they help clinicians to plan care for older people with diabetes?

Professor Trisha Dunning is Chair in Nursing and Director for the Centre for Nursing and Allied Health Research at Barwon Health and Deakin University in Geelong Australia. She is a registered nurse and accredited diabetes educator. She recently completed two consecutive 3-year terms on the Board of The International Diabetes Federation and is a member of the Board of Diabetes Victoria. She is a distinguished life Fellow of the Australian College of Nursing. Her research focuses on personalised care of older people with diabetes and diabetes palliative and end of life care. She is widely published in journals and books.

Background to the McKellar Guidelines
In 2006 the United Nations General Assembly declared diabetes an international public health issue. Diabetes is the most prevalent chronic disease and is associated with life threatening complications. In the over 60 age group most people have type 2 diabetes but some have type 1. Globally, older people account for 35% of all cases of diabetes (International Diabetes Federation (IDF), 2013) and one in four older people in care homes has diabetes (Sinclair et al., 2001). Diabetes is a leading underlying cause of disability and death in older people.

Diabetes and Older People
Diabetes is associated with cardiovascular, renal and liver disease, neuropathy and some forms of cancer. It affects functional status and quality of life and increases the risk of premature death (IDF, 2013). Most older people with diabetes have 3–5 comorbidities and take an average of seven medicines; consequently they are at high risk of functional decline and medicine-related adverse events (IDF, 2013, Dunning and Sinclair, 2014, Sinclair et al., 2014). Such events often lead to hospital admission. Hospital admissions increase older people’s stress, risk of falling, hospital acquired infections, delirium and confusion. In addition, they are often prescribed new medicines in hospital which are needed at the time but, are often not stopped when the person moves to another area of the hospital or is discharged. This contributes to avoidable polypharmacy. All of these factors affect functional status and self-care capability.

Chronological age does not indicate an individual’s functional status. Older people with diabetes are highly individual. They have different health issues and life experiences; therefore care must be individualised to suit their functional status, life expectancy, personal preferences, self-care capability, and nutritional status (IDF, 2013, Dunning et al., 2013). The following functional categories are guides to planning care for/with older people with diabetes:

1. Functionally independent and usually self-caring: most older people live in the community and are cared for by primary care professionals with a HbA1c goal* of 7-7.5%.
2. Functionally dependent: require support for many activities of daily living (ADL) and often diabetes self-care tasks, which is often provided by family members.
3. Frail with functional deficits: some older people who are frail may still be able to undertake some ADLs and diabetes-self-care with support; approximately 25% of older people with diabetes are frail. There are two sub-categories:
   a. Dementia: there are varying degrees and types of dementia. People with dementia may have physical functional deficits as well as dementia.
   b. End of life care: HbA1c goal* for frail older people and those at the end of life is 8%–8.5%.

*HbA1c refers to glycated haemoglobin, average plasma glucose concentration, clinicians use this measurement to monitor average blood sugar levels over a period of time.

Hypoglycaemia (low blood sugar) can be difficult to detect and have devastating consequences for older people. To reduce the risk of hypoglycaemia a safe blood glucose range for older people on glucose...continued on next page
Lowering medicines is between 4–11 mmol/L, if they are frail and have dementia (IDF, 2013).

A comprehensive care plan for older people encompasses proactively planning to stop activities such as driving and, commencing palliative and end of life care. Palliative care can be integrated with usual diabetes care to manage distressing symptoms and improve comfort and quality of life. Ensuring end of life care preferences are appropriately documented and communicated is essential to ensure people’s wishes are respected and the moral and ethical decision burden for families and clinicians are reduced. Family carers play a key role helping community-dwelling older people with diabetes and their wellbeing, healthcare and education needs must also be considered, including consideration for after their loved one dies.

The McKellar Guidelines for Managing Older People with Diabetes

Most recent ‘diabetes clinical guidelines’ include a section about ‘older people’, and recommend metabolic targets be personalised. However, they do not address many of the specific care issues and dilemmas that concern clinicians and family carers; for example functional status, life trajectories and age-specific factors that influence safety, independence and quality of life.


The guidelines recommend engaging the older person and/or their family to decide care targets and goals where practical, and adopting a proactive approach to identifying risks early so care can be planned to manage/minimise risks. There are 18 individual guidelines and five risk assessment tools. The risk assessment tools were designed to be used with existing assessment tools.

The McKellar Guidelines Diabetes-specific Risk Assessment Tools

- Diabetes risk screen for older people who do not have a diagnosis of diabetes.
- Hypoglycaemia risk.
- Glucose-lowering Medicine-related adverse event risk.
- Diabetes-specific falls risk.
- Diabetes-specific pain risk.

Each guideline consists of three sections: the care context, assessment processes and a care planning section. When relevant, other McKellar Guidelines and documents are cross referenced. A key point of difference between the McKellar and most other clinical guidelines is the care planning section, which includes information about how to use the assessments and recommendations to develop personalised care plans for older people.

Overview of the guideline development process

The National Health and Medical Research Council (NHMRC) Guidelines for Developing Clinical Guidelines (NHMRC, 1995) guided the development process. The processes included a structured literature review to ensure the guidelines were based on the best available evidence. Regular consultations with an interdisciplinary expert advisory group of health professionals and with key stakeholders from the aged care sector: nurses, geriatricians, general practitioners and personal care workers took place about the clinical relevance, usability, readability and design of the information. This iterative, consultative, development process was vital to the eventual acceptance and clinical relevance of the guidelines.
The guidelines were evaluated in a large regional and four small rural aged care homes to ensure they were adaptable to a range of clinical environments and acceptable to key stakeholders outside the research setting before they were released into the public domain. Older people with diabetes and their family carers were also consulted during the evaluation stage. In addition, a group of international aged care experts independently evaluated the guidelines.

Outcome and impact of the guidelines
The guidelines are currently being implemented in various Australian and some international practice settings, which suggests they are transferable outside the aged care homes in which they were developed and evaluated.

• They became policy at Barwon Health in 2014, which indicates they are sustainable after the research is completed. They were awarded the Barwon Healthcare Innovation Award in 2013.
• Medical record audits, undertaken before the guidelines were implemented in 2014 and approximately nine months after implementation in 2015, show changes consistent with the guidelines in residents’ care plans, including evidence that care is being personalised.
• McKellar Centre staff are required to attend annual professional development sessions that encompass The McKellar Guidelines.
• The risk assessment tools were translated into Norwegian in late 2014 and are being used in Norway.
• Preliminary discussions about translating the guidelines into Chinese were held with a geriatrician from China in September 2015.
• The guidelines were cited in the Australian Government Australian National Diabetes Strategy 2016–2020 released on World diabetes Day, November 14th 2015.
• The guidelines led to several peer-review and invited papers and presentations including presenting at the Australian Aged Care Better Practice Conferences in 2014 and the Australian National Association for Diabetes Centres Best Practice Conference and the IDF World Congress in 2015.

How to use the guidelines

The McKellar Way: How to use the McKellar Guidelines were developed to accompany the guidelines. It can help clinicians become familiar with the content of the guidelines and provides some practical examples of how to use the information to help clinicians plan care for/with older people with diabetes.

Clinicians can use the risk assessment tools to determine key risks for individual older people and then develop strategies with the individual and their family and other colleagues to manage the risks.

The guidelines can also be used as the basis for diabetes-related continuing professional development and to assess the standard of diabetes care.

Summary
The McKellar Guidelines are based on the best available evidence and can help nurses and other health professionals understand the complexity of diabetes in older people and plan evidence-based personalised care. Including older people with diabetes in the development process is consistent with global recommendations to involve the public and other stakeholders in planning health services.

Acknowledgements
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References
Dunning, T., Savage S, Duggan, N., (2013b) The McKellar Way: How to use the McKellar Guidelines for Managing Older people with Diabetes in Residential and Other Care Settings. Geelong Centre for Nursing and Allied health research, Deakin University and Barwon Health.
Rise in Chronic Conditions in Older People

A study which examined more than 15,000 people in England over ten years, showed there was an increasing trend in people aged over 50 developing more than one disease.

National Institute for Health Research (NIHR) funded researchers have found that older people are now increasingly likely to develop multiple chronic diseases, adding further strain on health budgets amid a rise in long-term conditions and people living longer.

The study, which examined more than 15,000 people in England over ten years, showed there was an increasing trend in people aged over 50 developing a second or third disease. It also found that people who were physically active were healthier.

The percentage of older people with multiple conditions, including Type 2 diabetes, high blood pressure and arthritis, steadily increased from 31.7 per cent in 2002/03 to 43.1 per cent in 2012/13, according to the article published in the online journal the International Journal of Behavioral Nutrition and Physical Activity (Dhalwani et al., 2016).

The proportion of older people without a chronic condition decreased over the same period from 33.9 per cent to 26.8 per cent, researchers also found.

Professor Kamlesh Khunti, Professor of Primary Care Diabetes & Vascular Medicine at the University of Leicester, said: “The prevalence of multimorbidity, where people have more than one chronic condition, in older adults is steadily increasing over time.

“The current models of care globally are based on the management of individual chronic conditions. However, given the increase in multimorbidity over the past 10 years and the complex needs of these patients, clinical guidelines need to address the challenges in management of multimorbidity and formulate best practices to guide clinical decision making for these patients.”

The study was carried out by researchers at the Leicester Diabetes Centre, an international centre of excellence in diabetes research, education and innovation led by Professor Khunti and Professor Melanie Davies. It is a partnership between the University Hospitals of Leicester NHS Trust and the University of Leicester, and funded by the NIHR Leicester-Loughborough Diet, Lifestyle and Physical Activity BRU and NIHR CLAHRC East Midlands.

To find out more please visit: http://www.leicesterdiabetescentre.org.uk

Reference


Older people can improve their balance and physical mobility with yoga-based exercise

A systematic review with meta-analysis was conducted to determine the impact of yoga-based exercise on balance and physical mobility in people aged 60+ years.

The review, published in Age & Ageing, found that yoga interventions resulted in small improvements in balance and medium improvements in physical mobility. Trials were included if they evaluated the effect of physical yoga (excluding meditation and breathing exercises alone) on balance in people aged 60+ years.

Further research is required to determine whether yoga-related improvements in balance and mobility translate to prevention of falls in older people also. Exercise that challenges balance is proven to prevent falls and one-third of community-dwelling older adults fall annually.

To find out more please visit: http://ageing.oxfordjournals.org
Age UK ‘Behind the Headlines’ Report

Age UK has released a report that explores the complexities around hospital discharge often faced by older people and their families.

The findings reveal that 1.75 million bed-days were lost from January to December in 2015 due to a lack of social care provision available for people being discharged from hospital, an increase of 28.4 per cent compared to 2014.

Cuts to community health and social care services have meant the NHS has wasted bed-days while patients wait for the right care and support in the right place to become available. To recover after a hospital stay different older people need different levels of support to make the fullest possible recovery. Some older people may be able to go straight back home, but many will need some kind of rehabilitative help to get fully better. In particular, older people may leave hospital less physically strong and less mobile, especially if they were already quite frail.

The report recommends focusing attention on strengthening the system for helping older people to get better after being in hospital, and investing sufficient resources to meet the needs of a growing older population.

To find out more please visit: www.ageuk.org.uk and download the ‘Behind the Headlines’ report.

Upcoming Events...

Care Home Open Day 17th June 2016
Care Home Open Day is a UK wide initiative inviting care homes to open their doors to their local communities. Thousands of care homes across the UK take part each year, welcoming the public and arranging events and activities that help to create lasting links between care home residents and their local communities. www.carehomeopenday.org.uk

World Congress on Active Ageing (WCAA) 28th June – 1st July 2016
This four day event in Melbourne features keynote speeches, plenary sessions, paper presentations, panel discussions, workshops and social events. Focusing on the field of Active Ageing due to increasing governmental focus on keeping ageing populations more healthy and active. www.wcaa2016.com.au

Falls Prevention and Management in Older People 6th July 2016
This conference in London focuses on falls prevention and management in older people, reducing falls and harm from falls, and monitoring progress against the 2015 National Quality Standard. www.healthcareconferencesuk.co.uk

National Association for Hospice at Home (NAHH) Annual Conference 2016 29th – 30th September 2016
This annual conference aims to share learning and develop practice from the wide range of hospice at home services. www.nahh.org.uk
A practical guide to drinking and dehydration in older adults

The DRIE team (Dehydration Recognition In our Elders, see http://driestudy.appspot.com/) includes Lee; a dietitian with a long term interest in the nutrition and hydration of older people, Florence, a scientist and teacher skilled at communication, and Diane; a nurse, midwife, and experienced research nurse. The DRIE team carry out research on identification and prevention of dehydration in older adults, with a focus on those living in long-term care. This dynamic research team is based in Norwich Medical School, at the University of East Anglia, and is currently working to develop and test an intervention to increase fluid intake in older adults living in long-term care.

A surprising number of older adults do not drink enough fluid. Recent studies show that one in every five older people (aged 65+) living in residential care or the community is dehydrated\(^1\) (Hooper et al., 2015a; Hooper et al., 2016), as are one in three older adults admitted acutely to a large UK teaching hospital (El-Sharkawy et al., 2015). Adults with cognitive or renal impairment, as well as those with diabetes, are more likely to be dehydrated (Hooper et al., 2015c).

What is dehydration?

Dehydration (also called water-loss or intracellular dehydration) results from not drinking enough fluid. It is different to hypovolaemia (salt loss dehydration) caused by excessive fluid losses from diarrhoea, bleeding or vomiting – although confusingly they are both sometimes referred to as dehydration\(^2\).

Dehydration is caused by not drinking enough fluid, leading to increased concentration (osmolality) of extracellular fluids (Cheuvront et al., 2013). In response to dehydration, water flows from inside the cells to dilute the extracellular fluid and maintain osmolality throughout the body. This in turn raises intracellular osmolality and shrinks cells which triggers osmoreceptors to signal thirst (stimulating drinking) and release antidiuretic hormone (ADH). This increases renal water resorption, concentrating urine and reducing urinary fluid loss.

As we age these elegant homeostatic mechanisms work less well. Both thirst and the body’s ability to concentrate urine decrease so that an older person’s ability to prevent dehydration is blunted (Arai et al., 2013; Fortes et al., 2015; Hooper et al., 2015a). Ageing is associated with a diminished proportion of water in the body, increasing susceptibility to dehydration (Olde Rikkert et al., 2009). Older adults may also actively choose to limit their fluids to control continence or limit toilet breaks, social drinking may decline as friends and partners are lost, those with cognitive limitations may forget to drink, and those with functional limitations may struggle to obtain drinks or consume them (Hooper et al. 2014).

Diagnosis of dehydration

Dehydration is diagnosed by measuring serum or plasma osmolality (using freezing point depression) from a venous blood sample; serum osmolality \(>300\text{mOsm/kg}\) equates to dehydration in older adults and 295-300\text{mOsm/kg} is impending dehydration (Cheuvront et al., 2013; Institute of Medicine 2004; Thomas et al., 2008). Serum osmolality is the most useful diagnostic tool for dehydration because it can be measured at a single assessment, is associated with adverse health outcomes, is the physiological trigger for thirst and renal concentration, is not affected by failing renal function, and directly measures effective solute in serum or plasma (Cheuvront et al., Sawka 2013; Hooper et al., 2014; Institute of Medicine 2004). A caveat is that for those with normal sodium, potassium, urea and glucose levels, raised osmolality equates to insufficient drinking, but if due to raised glucose then lack of diabetic control is the cause.

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\(^1\) defined as serum osmolality \(>300\text{mOsm/kg}\)

\(^2\) the term dehydration in this article refers exclusively to insufficient fluid intake, not volume depletion
How can one tell whether an older person is drinking enough fluid?

Whilst directly-measured serum osmolality is the most accurate method of diagnosing dehydration, it can be costly, so many physicians use osmolarity formulae combining sodium, potassium, urea and glucose. There are many equations in use, but for older people only one equation has been shown to accurately estimate osmolality:

\[ \text{Osmolarity} = 1.86 \times (\text{Na}^+ + K^+) + 1.15 \times \text{glucose} + \text{urea} + 14 \] (all measured in mmol/L) (Hooper et al. 2015a; Khajuria and Krahn 2005; Siervo et al. 2014).

An osmolarity (from this equation) of > 295 mmol/L suggests dehydration (sensitivity 84.5%, specificity 58.9%, positive likelihood ratio 2.05, negative likelihood ratio 0.26) and should be followed by directly measured serum osmolality to confirm dehydration (Hooper et al. 2015b).

How can we help older adults drink enough?

Research on how to help older adults drink well is remarkably inconclusive (Abdelhamid et al., 2016; Bunn et al., 2015). A systematic review assessing interventions and environmental factors for reducing dehydration in older adults living in long-term care found that the efficacy of many promising strategies remained unproven due to high risk of bias in study design (Bunn et al., 2015). The most promising strategies were multifactorial, increasing choice and availability of drinks, raising staff’s dehydration awareness, increasing assistance for drinking and supporting toileting. This suggests that exploring and solving individual barriers to drinking may be useful, but this has not been well tested. A systematic review of interventions to improve eating and drinking in those with dementia was again hampered by small, poorly reported studies. However, it suggested that a focus on improving the social element of eating and drinking provides positive results (Abdelhamid et al., 2016). A friendly chat over a cup of tea or coffee may be good for hydration, as well as our quality of life.

Unfortunately, in older adults, urinary tests for dehydration are not useful (Fortes et al., 2015; Hooper et al., 2016), probably because urinary concentrating capacity is limited, and there is no evidence that other signs such as skin turgor and mouth dryness are useful tests in older adults (Hooper et al., 2015c).

Effects of dehydration on health

Dehydration has important consequences for health. Dehydrated older people (serum osmolality ≥300mOsmol/L) have 40% greater risk of 8-year mortality, doubled risk of new disability over 4 years (after multivariate adjustment), and longer hospital stays compared to those who were well hydrated (Bhalla et al., 2000; El-Sharkawy et al., 2015; Stookey et al., 2004).

How much fluid should older adults drink each day?

European guidance (there is no clear UK guidance) suggests that men should drink at least 2.0L of fluid/day, whilst women should drink at least 1.6L fluid/day (EFSA Panel on Dietetic Products Nutrition and Allergies (NDA), 2010). This is in addition to the fluid obtained from foods. One way to check how much a patient is drinking is to complete a simple Drinks Diary over 24 hours (the Drinks Diary is free to download herewwww.uea.ac.uk/medicine/research/evidence-studies/drinks-diary) (Jimoh et al., 2015a; Jimoh et al., 2015b). All fluids, aside from strong alcohol, support good hydration (Maughan et al., 2016). Water is great to drink, but not mandatory and the myth that coffee is dehydrating deserves to be forgotten. However, if continence is a problem some older adults find that de-caffeinated tea and coffee help.

A lovely mug of tea... and more in the pot. This mug of tea contains 250ml of fluid. A woman will need at least 7 drinks of this size to reach her recommended 1.6L of drinks each day, while a man will need at least 8 to reach his 2.0L each day.

This glass of water contains 100ml of fluid. A woman will need to drink at least 16 small glasses of drink (this size) each day, and a man at least 20 to stay well hydrated. A fuller glass would contain 200mls (a woman would need at least 8 of these, and a man at least 10 of these, each day).
Dehydration and diabetes

People with diabetes are at increased risk of dehydration and raised blood glucose inflates serum osmolality and increases thirst (though older adults may not feel thirsty despite raised glucose) (Hooper et al., 2015c). Raised serum osmolality can indicate poor glucose control, insufficient drinking, or both, so serum osmolality should be measured alongside serum glucose – if glucose is normal, then serum osmolality indicates whether the older person is dehydrated. If glucose is raised, then glucose control needs to be addressed, before hydration status can be independently assessed.

Summary

Dehydration, due to insufficient fluid intake, is common in older adults. Dehydration is associated with increased mortality, disability and longer hospital stays, so there is a need to be aware of the risks to older patients and support them to drink well. Simple tests to detect dehydration in older adults are ineffective or untested, so blood testing must be relied upon, using either directly-measured serum osmolality, or calculating osmolality using the equation described above. Many older adults assume they are well hydrated because they do not feel thirsty so a simple health message about drinking plenty even when not feeling thirsty is needed. Encouraging drinking, discussing barriers to drinking with patients, and social interaction around drinks may all be useful strategies.

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References


Type 1 diabetes care in the modern era – age is no barrier to a good outcome!

Helen has been a consultant physician in Glasgow since 2001, and her main interest is research and development to improve clinical services. A desire to improve Type 1 diabetes outcomes locally led her to the DAFNE programme in 2007, when she developed DAFNE provision in Glasgow. Helen now chairs the DAFNE UK Executive Board which is operationally within Northumbria Healthcare NHS Foundation Trust. Helen feels passionately that a unifying philosophy and consistency in information and resources leads directly to improved outcomes for users, and work related satisfaction for providers.

**Type 1 diabetes overview**

Type 1 diabetes, which can only be treated with insulin injections, is a distinctly separate disease from type 2 diabetes of which we hear so much in the media. Type 1 diabetes, previously known by the outdated name of insulin dependent diabetes, arises when insulin production in the body fails. This means the body cannot control the level of glucose (sugar) in the blood and so it rises above normal levels. Without insulin replacement there is rapid weight loss, serious illness and death. Since the development of insulin therapy in 1922 type 1 diabetes has become survivable, but individuals are at risk of developing disastrous complications affecting the small blood vessels of the eyes, kidneys and feet that can lead to blindness, kidney failure and amputations.

We now have many people in the UK who have had type 1 diabetes for many years thanks to insulin therapy. There are around 600 people per 100,000 with the condition. Modern understanding of what contributes to diabetes complications comes largely from the Diabetes Care and Complications Trial (DCCT) (The Diabetes Control and Complications Trial Research Group, 1993) showing that the closer blood glucose levels are to normal, the lower the risk of complications developing. The DCCT involved huge numbers of people with type 1 diabetes randomly allocated to either ‘usual care’ or ‘intensive therapy’ (extra input from healthcare professionals who adjusted insulin doses to get the blood glucose as near normal as possible). This showed dramatic benefits in the intensively managed group in terms of reduced complications, and beneficial effect has continued over many years of follow-up. However, the intensively managed group suffered high levels of a very dangerous and unpleasant side effect of insulin therapy called hypoglycaemia (hypo), which is especially dangerous in elderly people who are at risk of accidental injury if they become confused or fall during a hypo.

Furthermore, the more hypos an individual suffers from, the less warning symptoms they will have the next time they have a hypo, which can lead to a condition called hypoglycaemia unawareness with the obvious dangers that entails.

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How is modern type 1 diabetes therapy different?
Normal insulin secretion in the body occurs in response to digested food entering the blood stream and raising the blood glucose (figure 1). Not all foods will cause the blood glucose to rise; largely only food containing carbohydrates (CHO) will do this. When the DCCT was carried out in the 1990s, people with type 1 diabetes were taught to regulate their CHO intake evenly across the day and to take a fixed amount of insulin. This led to a restrictive diet with a complete lack of flexibility and most people found it impossible to adhere to, so their blood glucose control was not optimal. In Germany in the 1980s Professor Michael Berger and his team developed a training programme to teach people with type 1 diabetes how to calculate an insulin dose according to the food they were about to eat (Mühlhauser et al., 1983). This was revolutionary. It allowed people to eat a normal diet as flexibly as they wished; their blood glucose control improved; and most importantly there was a reduction in hypoglycaemia, rather than an increase as there had been in the DCCT. The results were so good that a team of UK diabetes professionals went over to Dusseldorf to see the programme, translated it and ran a trial in the UK. The British version of the training is called DAFNE. The randomised trial published in 2002 showed that DAFNE training was associated with significantly improved blood glucose control and well as a huge improvement in quality of life related to treatment confidence and flexibility (DAFNE Study Group, 2002).

What is DAFNE?
DAFNE training is now delivered in over 70 diabetes services across the UK; and in Australia, New Zealand and Kuwait. It involves a 5 day training course for people with type 1 diabetes that can be delivered either Monday-Friday, or 1 day a week over 5 weeks. There is a lot to learn, and anecdotal feedback suggests that older people prefer the 5 week format with a slower pace of learning and chance to absorb and process new information before the next week’s lesson. Uptake of the course is likely to be higher where patients are offered the choice of format. There are 8 people on each course and much of the benefit relates to participants learning from each other as well as from the educators. Participants use 2 different types of insulin injected on average 5 times daily: background intermediate acting insulin twice daily on waking and retiring, and quick acting insulin before eating carbohydrate (figure 2). Meals or
snacks that do not contain carbohydrate do not require any quick acting insulin to be injected. Eating food containing carbohydrate requires a dose calculation which relates to the quantity of carbohydrate and the personal insulin to carbohydrate ratio. Several models of blood glucose meters now have 'bolus calculators' within them to assist with dose calculation. Participants can therefore eat freely and flexibly without diabetes related restriction, and can adjust their daily routine to incorporate irregular mealtimes and exercise.

The DAFNE course provides training for insulin dose adjustment during sickness, exercise, coping with the effects of alcohol and eating out. Ongoing research has shown huge savings for the NHS in terms of reduced emergency treatment costs for people who have completed DAFNE training (NICE, 2013).

Reports of benefits for participants in terms of quality of life, reduced depression and anxiety scores, and reduced severe hypoglycaemia continue to be published (Hopkins et al., 2012). There is no upper age limit for participants on DAFNE – just a requirement for an open mind, willingness to learn new skills, and ability to understand some simple arithmetic with the help of a calculator if necessary! We looked specifically at our database in relation to age of participant and how long they had diabetes before undertaking DAFNE. We confirmed that there was no link between duration of diabetes and deriving benefits from DAFNE – the oldest participant was 74 and had type 1 diabetes for 55 years (Elliott et al., 2012)!

Comments from participants on DAFNE courses are perhaps the most moving and convincing feedback I can share with you. Here are just a few:

“DAFNE has quite literally transformed my life – if only it had been available when I was first diagnosed”

“DAFNE has given me my life back”

“The course was hard work – I hadn't been in a classroom for over 30 years – but it was honestly the most useful week I have ever spent in my life”

Contact your hospital diabetes team to find out whether there is DAFNE course provision in your area.

More patient testimonials at: www.dafne.uk.com

Healthcare professional enquiries: dafne@northumbria-healthcare.nhs.uk

References:
The Cochrane Collaboration is an international network of more than 28,000 dedicated people from over 100 countries. They work together to help healthcare providers, policy-makers, patients, their advocates and carers, and the general public make well-informed decisions about health care, by preparing, updating, and promoting the accessibility of Cochrane Reviews.

Management of type 2 diabetes

There are many different strategies and techniques used in the management and self-management of type 2 diabetes.

The use of computer programmes designed for self-management of diabetes appear to be safe to use and to have a small positive effect on blood sugar control. The effects however, seem to be limited to blood sugar control with no evidence to show that they can help with weight loss, depression or improving health-related quality of life. Interestingly mobile phone apps seem to be more effective than computer programmes, presenting larger positive outcomes on blood sugar control.

In patients with type 2 diabetes who are not using insulin and have had diabetes for over a year, the overall effect of self-monitoring of blood glucose on glycaemic control is small up to six months after initiation and further reduces after 12 months. Additionally, there is no evidence that self-monitoring affects patient satisfaction, general well-being or general health-related quality of life.

Unfortunately, most people with type 2 diabetes are overweight but weight loss appears very difficult to achieve in the long-term and there is no high quality data on the efficacy of dietary treatment. Using computer-assisted methods to record diet history can be as accurate as the oral-and-written method and may potentially allow doctors to spend more time with their patients to discuss their health, as opposed to them taking measurements.

Exercise is generally recommended for people with type 2 diabetes. Exercise does appear to improve blood sugar control at six and twelve months and no adverse effects from undertaking exercise have been reported. It is known that exercise decreases body fat content, thus the failure to lose weight with exercise programmes is probably explained by the conversion of fat to muscle.

The use of herbal medicines for the treatment of diabetes has a long history especially in the East. Some low quality evidence does indicate that herbal medicines could lower blood sugar and relieve symptoms in patients with diabetes. However, further research is required and current evidence does not support their routine use.

Prevention of Type 2 diabetes

Exercise and diet has been shown to reduce the incidence of diabetes by 37%. Reported diets mainly consisted of caloric restriction if the person was overweight, low fat content (especially saturated fat), high carbohydrate content and increased fibre. Physical activity required at least 150 minutes each week of brisk walking or other activities such as cycling or jogging.

References:
What is your current position and what was your career path that took you there?

I am a Reader in research synthesis, nutrition & hydration at Norwich Medical School, at the University of East Anglia. When I was 12 or 13 I volunteered to take drinks around to the residents in my local care home, and my first full time paid job was as a carer in what was then called an “old peoples home” – now I carry out research on eating and drinking in residential care. In between I got a degree in Biochemistry then became one of the UK’s first heart health dietitians. One of my patients asked whether the dietary advice I was giving him after his heart attack would make any difference to whether he would be able to watch his grandson grow up. Realising I really didn’t know the answer I spent an afternoon in the library trying to answer his question (unsuccessfully), and over time realised that I needed to carry out a systematic review (it turned into 3 systematic reviews and a PhD) to find the answer. The research bug “took” and now I carry out and teach research, while still being a dietitian, carer and biochemist.

What challenges do you face in your current position and which has been the greatest one?

The greatest challenge – learning to follow the questions that patients and research participants ask, the ones that stump me (despite others thinking me naive).

In your opinion, what are the top three issues affecting the care of older people?

How to support older adults to remain socially connected (engagement), how to help them drink plenty of fluids (hydration) and how to support older adults in making their own decisions for as long as possible (self-determination).

What changes in elderly care do you anticipate in the next few years?

Many of our older adults are delightfully modest and unassuming. As we baby boomers begin to enter residential care this will change and elderly care will be forced to change too. Balancing this with greater numbers of older adults, living longer and with reduced tax income to cover the costs will be a change and a challenge.

If you hadn’t become a researcher, what might you have done?

I always thought that I was a bit of an earth mother – so maybe a permaculture gardener or a guerrilla knitter… though maybe not!

What experience has influenced your career the most?

The thoughts, ideas, concerns and worries of the older patients and care home residents who I work with – their concerns and questions are the ones to address. Following those has driven my career.

What advice would you give to someone contemplating following in your footsteps?

There isn’t really a trail, or plan, that has driven my footsteps, it has been more of a wander. I suggest starting where you are, and looking around. What is the most interesting route you could take from here? Go in that direction.

Where do you go for advice and information?

I am very lucky – my mum is a great source of wisdom and support, as is my husband in a different way, and both my children are far wiser than me.

Who would you most like to work with?

Lots more older adults – I always learn from them. As a young adult I remember being hugely reassured listening to the stories older people told about their lives. Their lives often seemed a bit random and unplanned, but they were good lives, enjoyed and made the best of.

What do you enjoy doing when you are not working?

I have just become a grandmother – what a joy! So changing nappies, cooing, bouncing and saying daft things to Teya are pretty high on my list.

What do you do in a typical working day?

There isn’t really a typical day – I may be working in a care home recruiting residents, teaching medical students, writing a funding bid, doing paperwork, having a day of meetings (no one can get away from those!) or analysing and writing up our research. The variety is a joy.

If you were stranded on a desert island what would be your one luxury?

A knife for carving – I assume there would be some logs around on the island and I have a plan to make a family totem pole, this sounds like the perfect opportunity!

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In our next quarterly issue of Innov-age we will be looking at older people and end of life care.

One third of all deaths are people aged 85 and over. However, only 15 per cent of those gaining access to specialist palliative care are in this age group. It is important to understand and be able to discuss all available choices about older peoples care, including what to expect during end of life care, and how and where people would like to be cared for. Of people receiving hospice care that have engaged in advance care planning (ACP), 10% die in hospital compared to 26% of those who have not engaged in ACP (Age UK, 2016). Join us for the next issue of Innov-age where our contributors share their knowledge and experiences of this and other important eldercare issues...