Predictors of dehydration in older people living in UK residential care

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for the Dehydration Recognition In our Elders (DRIE) study (see http://driestudy.appspot.com/)
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Background: Dehydration is common in frail older people and associated with increased mortality, disability and morbidity.

Aim: We explored factors associated with dehydration in older people living in residential care.

Methods: The DRIE (Dehydration Recognition In our Elders) study recruited people aged ≥65 years living in UK residential care (without cardiac or renal failure).

We took blood samples from participants to determine serum osmolality (>300mOsm/kg defined dehydration). Additional assessments included the Mini-Mental State Examination (MMSE), sitting and standing blood pressure (BP) and nutritional status. Staff were asked about participant's functional status (Barthel Index), chronic illness, health-professional contacts, continence, stage of dementia and medications.

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Methods cont: We used univariate logistic regression to determine factors associated with dehydration, then multivariate stepwise backwards logistic regression, including statistically significant univariate factors, removing factors with the highest p-value one by one until all remaining factors were statistically significant.

Results: Analyses included 188 participants, of whom 66% were women, mean age 85.7 years (range 65-105). Their mean MMSE was 21 (consistent with mild dementia, range 0-30, serious dementia to no dementia). 31% were unable to give their own informed consent (needed consultee consent) and 20% were dehydrated (serum osmolality >300mOsm/kg).

In univariate analyses a wide range of factors predicted dehydration. In the multivariate model, adjusting for age and all other factors at once, dementia, using diabetic medication, swollen feet, poor renal function, higher numbers of prescription medications and health professional contacts, and lower standing blood pressure were all associated with greater odds of dehydration (Table).

Conclusions: A range of diverse factors are moderate predictors of dehydration in care home residents, including markers of cognitive and physical frailty. We need to find ways of identifying individuals becoming dehydrated.

Factor	OR (95% CI)
Dementia assessment by staff - Moderate or severe dementia vs. none or minor dementia	5.77 (1.98 to 16.80)
Being unable to correctly copy 2 intersecting pentagons, or not attempting it vs. achieving it.	4.14 (1.62 to 10.55)
Standing diastolic BP 3 minutes after standing up, 40 to 73mmHg vs. >73mmHg or no measurement	2.71 (1.07 to 6.89)
Number of health-professional contacts over past 2 months, rise in risk per additional contact	1.06 (1.02 to 1.11)
Feet too swollen to allow foot assessment vs. assessment possible	4.72 (1.65 to 13.49)
Number of prescription medications, rise in risk per additional prescription	1.11 (1.01 to 1.23)
Uses any diabetic medication (injection or tablet) vs. no diabetic medication used	8.81 (2.30 to 33.65)
Estimated glomerular filtration rate (eGFR), reduction in risk with each additional 1ml/min/1.73m^2	0.97 (0.95 to 1.00)

Table. Factors predicting dehydration in older people living in residential care in multivariate forward stepwise logistic regression, adjusting for age and each included factor

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