Signs of Water-Loss Dehydration in Older Adults: a Diagnostic Accuracy Systematic Review

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Objective

We aimed to assess the diagnostic accuracy of possible clinical and physical signs, symptoms and indications of water-loss dehydration in elders against serum osmolality or weight change (reference standards).

Introduction

Water-loss dehydration is common in elders and associated with increased risk of disability, mortality, respiratory infections, urinary tract infections, unplanned hospital admissions, constipation, pressure sores, falls and impaired cognition. We need to accurately diagnose water-loss dehydration to help protect older people.

Methods

Structured searches were run in seven databases. Assessment of inclusion, data extraction and assessment of validity were duplicated. Where data sets included index tests and a reference standard, but were not analysed for diagnostic accuracy, reviewers analysed the data.

Diagnostic accuracy of each indicator was assessed against the best reference standard, and data presented in sensitivity and specificity forest plots. Pre-set minimum sensitivity was 60%, specificity 75%. Secondary analyses created receiver operating characteristic (ROC) curves for continuous tests.

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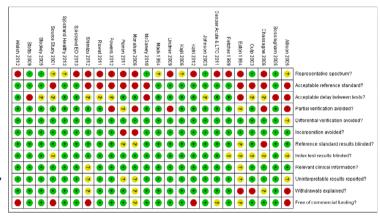


Table 1: Risk of bias summary. Green indicates low risk of bias, orange unclear risk of bias, red high risk of bias (as assessed by reviewers).

		Expressing fatigue	(useful in 1 of 1 studies)	
Potentially	From Missing drinks between meals			
useful signs,	primary		(useful in 1 of 1 studies)	
which need	analyses	BIA Resistance, 50kHz		
further			(useful in 2 of 4 studies)	
assessment	From	Axillary moisture	(useful in 1 of 1 studies)	
	secondary	Drinks intake	(useful in 2 of 4 studies)	
	analyses	Urine osmolality	(useful in 1 of 6 studies)	
		Dry mouth	(not useful in 8 studies)	
Signs with good		Feeling thirsty	(not useful in 6 studies)	
evidence of <u>lack</u> of		Heart rate	(not useful in 4 studies)	
diagnostic utility		Urine color	(not useful in 4 studies)	
		Urine volume	(not useful in 6 studies)	

Table 2: signs of dehydration in older people – results of a systematic review. "Useful" was pre-set in the review protocol to mean sensitivity of at least 60% and specificity of at least 75%.

Results

We included 24 studies (67 tests). No index tests were reproducibly usefully diagnostic of water-loss dehydration in older people, but promising tests included expressing fatigue, missing drinks between meals, BIA resistance at 50kHz, axillary moisture, drinks intake and urine osmolality.

There was sufficient evidence to suggest that some tests should <u>not</u> be used to indicate dehydration: dry mouth, feeling thirsty, heart rate, urine color and urine volume.

Conclusions

There is limited evidence of the diagnostic utility of any individual sign to indicate water-loss dehydration in elders. Individual signs should not be used in this population to indicate dehydration.

This recently completed systematic review is important to clinical practice since care providers currently use a variety of signs and symptoms to identify dehydration – but by doing so may be wrongly labelling people as well hydrated or dehydrated.

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