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Title: Establishing the prevalence of delirium in hospital inpatient settings

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Introduction:

Delirium, which is an acute state of confusion is well established as a common problem in hospital settings. Delirium has been shown to increase length of stay in hospital, contribute to functional decline and permanent changes in cognition. For these reasons and many more it is advised that patients over 65 should be screened for delirium as this facilitates effective use of delirium prevention, monitoring and management strategies.

Two brief standardised screening tools for delirium are the Confusion Assessment Method (CAM) and the 4AT. The CAM is considered the gold standard for identifying delirium, and although recommended it is rarely being used in Christchurch hospitals. The 4AT is more recently developed screening tool which is designed for rapid use in routine care. It is currently already being introduced into certain medical and surgical wards in Christchurch Hospital.

Aim:

This study aimed to establish the point prevalence of delirium in patients aged 65 years or over in hospital inpatient settings. Additionally, we aimed to evaluate the 4AT as a tool to identify delirium by comparison with the CAM.

Impact:

This project will provide up to date information on delirium rates in various inpatient settings which will inform screening recommendations and service delivery.

Method:

All eligible patients (age 65 years or over) in eleven wards at Christchurch and Burwood Hospitals were interviewed using both the CAM and 4AT. Wards surveyed included rehabilitation, orthopaedic, older persons health and acute medical assessment wards. Each ward was assessed over a 1-2 day period to obtain point prevalence data. Patient clinical notes and discharge summaries were used to provide demographic and background information to aid interpretation of the CAM/4AT. This included reason for and time since admission, any previous diagnosis of dementia or evidence of cognitive impairment, current medications, alcohol use and living situation.

The results of both screening tools were included in the participant's notes on the day of assessment. Providing this information to the treating team enabled these results to contribute to the participant's ongoing care as appropriate. Where a delirium or possible delirium was identified, the discharge summary was checked to determine whether a delirium was diagnosed, and whether this information was provided to the patient's general practitioner (GP). The data was then analysed and the prevalence values were compared.

Results:

A total of 151 participants were recruited and interviewed, with the majority aged in their 70's and 80's. 58% of this study population were female and 97% identified as European. The table below shows the prevalence of delirium identified in this population using each screening tool and clinical practice (the documentation of delirium in clinical notes/discharge summary was used to inform the clinical practice prevalence).

	Prevalence of Delirium
CAM	12.6 %
4AT	19.9 %
Clinical Practice	6.6 %

These figures are concordant with overseas studies in which the prevalence of delirium varies between 10 and 30%. The prevalence of delirium according to clinical practice was low compared to both tools, which supports suspicions that delirium is under-recognised in hospitals. Prevalence values were similar for each assessment method at both Christchurch and Burwood Hospitals.

The following table addresses our second aim of comparing the two screening tools. The number of cases of delirium identified using each tool is shown and were then used to evaluate the 4AT.

	CAM+	CAM-	Total
4AT '+' (score ≥4)	19 (true positive)	11 (false positive)	30 (positive 4ATs)
4AT '-' (score ≤3)	0 (false negative)	121 (true negative)	121 (negative 4ATs)
	19 (total with delirium)	132 (total without delirium)	151

Using the CAM as the gold standard, the sensitivity (100%), specificity (92%), positive predictive value (63%) and negative predictive value (100%) of the 4AT were calculated.

Conclusion:

Our results indicate that delirium is common and has low rates of detection in clinical practice. Considering the 4AT is not intended to be a diagnostic tool for delirium, our finding that it is less specific than the CAM is unsurprising. As a screening tool however, having a high sensitivity and negative predictive value is very encouraging as this means true instances of delirium would rarely be missed.

Overall, we found that the 4AT is a feasible screening tool which is well tolerated by patients and has several advantages over the CAM for this purpose. Namely, the 4AT is several minutes

quicker to complete, does not contain subjective judgement of a patient's presentation and does not require training of the interviewer. This makes the 4AT easier to administer and accessible to all health workers.

Through this research we have provided up to date information on the prevalence of delirium in Christchurch and Burwood Hospitals, with suggestion that this is being insufficiently detected at present and could benefit from effective screening. Altogether, these findings support the introduction of the 4AT in Christchurch Hospitals as a useful and sensitive screening tool for delirium.