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Identification of delirium and dementia in older medical inpatients in Tanzania: A comparison of screening and diagnostic methods

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ABSTRACT

Background: In sub-Saharan Africa, there are no validated screening tools for delirium in older adults. This study assesses clinical utility of two instruments, the IDEA cognitive screen and the Confusion Assessment Method (CAM) for identification of delirium in older adults admitted to medical wards of a tertiary referral hospital in Tanzania.

Method: The IDEA cognitive screen and CAM were administered to a consecutive cohort of older individuals on admission to Kilimanjaro Christian Medical Centre using a blinded protocol. Consensus diagnosis for delirium was established against DSM-5 criteria and dementia by DSM-IV criteria.

Results: Of 507 admission assessments, 95 (18.7%) had DSM-5 delirium and 95 (18.7%) had DSM-IV dementia (33 (6.5%) delirium superimposed on dementia). The CAM and IDEA cognitive screen had very good diagnostic accuracy for delirium (AUROC curve 0.94 and 0.87 respectively). However, a number of participants (10.5% and 16.4% respectively) were unable to complete these screening assessments due to reduced consciousness, or other causes of reduced verbal response and were excluded from this analysis; many of whom met DSM-5 criteria for delirium. Secondary analysis suggests that selected cognitive and observational items from the CAM and IDEA cognitive screen may be as effective as the full screening tools in identifying delirium even in unresponsive patients.

Conclusion: Both instruments appeared useful for delirium screening in this inpatient setting, but had significant limitations. The combination of assessment items identified may form the basis of a brief, simple delirium screening tool suitable for use by non-specialist clinicians. Further development work is needed.

1. Introduction

Delirium is an acute onset syndrome of cognitive dysfunction presenting with deficits in attention, arousal and global cognition [1], highly prevalent in older hospitalised adults in high-income countries (HICs) [2]. Well-recognised adverse outcomes include cognitive decline [2–5], disability [6,7] and increased mortality rates [3,6].

Although prompt interventions can improve outcome [8], delirium remains under diagnosed, and may be missed in up to 50% of cases in HICs [9,10]. Diagnosis is most challenging in some of those most at risk, such as older people and those with preexisting cognitive impairment. Use of validated screening tools improves detection rates [9,11].and is recommended in guidelines for older hospitalised adults [12].

In sub-Saharan Africa (SSA), there are currently no validated screening tools for delirium in older people. Demographic transition has resulted in a rapidly growing older population, and recent

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epidemiological studies of dementia suggest a similar prevalence to that seen in HICs [13,14]. Delirium is likely to be similarly prevalent in older adults but existing data are limited. Currently available data suggest a high rate of misdiagnosis of delirium as a psychiatric disorder and adverse outcomes [15]. A substantial diagnostic gap is suggested by the fact that the limited available studies report prevalence of 9.1–19.7% [16,17] on clinical criteria whereas in contrast a large case-note based study of older people admitted to three large centers in SSA reported delirium prevalence of 0–2.6% [18].

This diagnostic gap may also be due to shortages of specialist clinicians with skills in cognitive assessment. Geriatricians, psychiatrists and neurologists are scarce across SSA outside large urban centers [19–21]. Cognitive assessment tools and other screening methods developed in HICs often perform poorly in SSA due to cultural differences and high levels of illiteracy amongst older adults, especially in rural areas [12]. Therefore, objective screening methods for the cognitive impairments typical of delirium, that can be used accurately by non-specialists and are not literacy-dependent, are needed.

Our overall aim was to determine the most effective method of screening and identification of delirium in older hospitalised adults in SSA. Key objectives were: 1) Evaluate the performance of two screening instruments with potential utility for identification of delirium in this setting (the IDEA cognitive screen and Confusion Assessment Method (CAM)) against gold-standard DSM-5 consensus diagnosis of delirium; and 2) Conduct a secondary analysis of all screening and assessment items to determine those most predictive of delirium and potentially useful in development of a screening method for use by non- specialists.

2. Materials and methods

2.1. Ethical approval and consent

Ethical approval was granted locally by the Kilimanjaro Christian Medical College Research and ethics committee (CRERC) and by the National Institute of Medical Research (NIMR) of Tanzania in Dar-es-Salaam. Patients were given written and verbal information about the study and its aims before gaining their informed consent. Where patients were unable to write, a thumbprint was used. If patients were admitted unconscious or lacking the capacity to consent, a close relative was asked to assent on the patient's behalf.

2.2. Setting and study participants

This study took place in the internal medicine department of Kilimanjaro Christian Medical Centre (KCMC), an 800-bed tertiary referral hospital in Northern Tanzania serving a rural population of over eight million people. Consecutive samples of individuals aged 60 and over admitted to the department from 14th January to 3rd February 2015 (pilot phase) and from 6th March 2015 to 10th July 2015 were invited to participate on admission. No substantial changes were made to the study design or data collection methods following the pilot phase and so data were combined for analysis (Fig. 1).

2.3. Assessments

Initial clinical assessment took place wherever possible in the morning after admission, following initial review by the treating medical team. The following data were collected: background demographic data alongside physical observations; level of arousal using the Alert-Voice-Pain-Unresponsive (AVPU) scale [22] designed for use by non-specialists in routine practice and pain assessed on a visual analogue scale of 0–10 with 10 rated as most severe. Where necessary, non-literate or observational assessments (e.g. Wong-Baker Faces scale) were used and equivalent scores recorded. Data on medical diagnoses, co-morbidities, risk factors and outcome were also collected and participants reassessed every three days during admission to determine in-hospital incidence of delirium. This study relates to screening at admission only.

2.4. Clinical assessment for delirium and dementia

All patients were assessed by a research doctor with an interest in geriatrics or psychiatry (S-MP, AD, EGL or LT) assisted by a trained study nurse or clinical officer with experience of cognitive assessment in older adults, and fluent in both English and Swahili. Clinical assessments were conducted independently of, and blinded to, IDEA cognitive screen scores. Full assessment for cognitive impairment included a neurological examination, detailed standardised bedside cognitive assessment and mental state examination recorded in free text (see Fig. 1). Where significant low mood was observed, the brief Geriatric Depression Scale (GDS) was used to identify possible depression as a possible cause of poor cognitive performance but depression or other psychiatric disorders were not the main focus of the assessment and were not routinely screened for. Assessment of potential confounders of screening tool performance including educational level and sensory impairment was also carried out (see Fig. 1).

Pre-existing dementia was assessed through a detailed semi-structured informant history for cognitive and functional impairment based on DSM-IV criteria previously used for dementia assessment in Tanzania and Nigeria [23]. Informants were usually close relatives and resident in the same household. All informants were asked ‘is this a recent change?’ Use of a single question in identification of delirium has been validated in HICs [24].

In order to take into account possible fluctuations in presentation, a subset of participants were reviewed by a neurologist or physician to increase accuracy of diagnoses, where possible this assessment took place later the same day. This assessment took place blinded to the outcome of both screening tools to maintain objectivity. Where possible all those screen-positive on the CAM were assessed alongside 10% of screen-negative individuals, selected using a random number generator.

2.5. Consensus diagnoses of delirium and dementia

All clinical assessment data, with the exception of the IDEA cognitive screen result and CAM algorithm, were reviewed by a consultant old age psychiatrist, nurse specialist in old age psychiatry and research doctor in psychiatry (EML, GC, S-MP) for blinded consensus diagnosis of delirium by DSM-V criteria. Cases of subsyndromal or resolving delirium not meeting DSM-V criteria were recorded, but classified as ‘no delirium’.

We considered it important to accurately identify dementia in order to assess screening tool performance in delirium versus cognitive impairment in general. Consensus diagnoses of dementia followed DSM-IV criteria, taking into account all available clinical information, including previous admission records where available. In cases of possible dementia not meeting DSM-IV criteria a follow-up assessment was offered for diagnostic clarification after discharge. Where necessary, due to geographical constraints, this assessment took place by telephone interview with a close relative. Dementia subtype diagnoses were made by clinical criteria where possible, but limited, partly because neuroimaging was not available at the time of the study. Other psychiatric disorders were noted where a clear clinical description of symptoms made this possible.

2.6. Identification of delirium or major cognitive impairment by treating medical team

A retrospective case note review compared consensus diagnoses of delirium with identification of delirium by the treating medical team during admission (see Fig. 1).