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CAGE Questionnaire as a Screening Tool for Hazardous Drinking in an Acute Admissions Ward: Frequency of Application and Comparison with AUDIT-C Questionnaire

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***Abstract*—**The aim of this audit was to examine the efficiency of alcohol history documentation and screening for hazardous drinkers at the Medical Admission Unit (MAU) of Northern General Hospital (NGH), Sheffield, to identify any potential for enhancing clinical practice. Data were collected from medical clerking sheets, ICE system and directly from 82 patients by three junior medical doctors using both CAGE questionnaire and AUDIT-C tool for newly admitted patients to MAU in NGH, in the period between January and March 2015. Alcohol consumption was documented in around two-third of the patient sample and this was documented fairly accurately by health care professionals. Some used subjective words such as 'social drinking' in the alcohol units' section of the history. CAGE questionnaire was applied to only four patients and none of the patients had documented advice, education or referral to an alcohol liaison team. AUDIT-C tool had identified 30.4%, while CAGE 10.9%, of patients admitted to the NGH MAU as hazardous drinkers. The amount of alcohol the patient consumes positively correlated with the score of AUDIT-C (Pearson correlation 0.83). Re-audit is planned to be carried out after integrating AUDIT-C tool as labels in the notes and presenting a brief teaching session to junior doctors. Alcohol misuse screening is not adequately undertaken and no appropriate action is being offered to hazardous drinkers. CAGE questionnaire is poorly applied to patients and when satisfactory and adequately used has low sensitivity to detect hazardous drinkers in comparison with AUDIT-C tool. Re-audit of alcohol screening practice after introducing AUDIT-C tool in clerking sheets (as labels) is required to compare the findings and conclude the audit cycle.

***Keywords*—**Alcohol screening, AUDIT-C, CAGE, Hazardous drinking.

I. Introduction

ALCOHOL misuse costs Britain £6 billons every year. Around 12% of the NHS budget goes to manage the alcohol-related disorders including alcohol related liver disease in the hospital settings. Evidence suggests that approximately 20% of patients admitted to the hospital are potentially hazardous drinkers [1].

A recent National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report on the management of Alcoholic Liver Diseases (ALD) in 218 hospitals in the UK demonstrated that our overall management of the alcohol problem is inadequate [2]. They stated that inadequate alcohol history was taken in around half the cases of ALD admitted to the hospital. Brief intervention, which can be a quick advice from doctors with the help of information leaflet or booklet and/or alcohol liaison team support, can encourage more than 12% of patients to reduce or stop alcohol intake [2].

It is a fact that CAGE (Cut down, Annoyed, Guilty, Eye-opener) questionnaire is incorporated into Sheffield Teaching Hospitals (STH) medical clerking sheets as alcohol misuse assessment tool. However, the Guideline Development Group (GDG) favoured the abbreviated Alcohol Use Disorders Identification Test (AUDIT-C) questionnaire as a routine measure [3]. According to NICE guideline 2012, CAGE questionnaire as a screening tool is not recommended [3].

II. Literature Review

The alcohol disorder identification test (AUDIT) is currently used in many parts of the world, not only in the English speaking nations. It has been translated to different languages to suit the clinical practice in different cultures [1]. It has been developed by World Health Organisation (WHO) for the early detection of alcohol dependence and hazardous or risky drinking [3]. It is a ten-question tool which includes "questions to assess the amount and frequency of alcohol intake (items 1-3; this component is called AUDIT-C (Consumption), alcohol dependence (questions 4-6) and problems related to alcohol intake (items 7-10)" [4].

A systematic review by [5] suggested that the AUDIT assessment tool has high sensitivity and specificity for detecting hazardous drinking. While, the CAGE, among all the analysed other screening tools, presented the worst results, even though it continues to be widely used in clinical practice over the world due to its simplicity [5].

One of the abbreviated versions of the AUDIT assessment tool is AUDIT-C. It is very practical to use a concise questionnaire for alcohol screening, especially in busy clinical settings [1]. The National Epidemiologic Survey on Alcohol

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and Related Conditions (NESARC) in the US general population tested AUDIT-C in a large sample (n = 43,093). It has been shown that AUDIT-C was more efficient in screening for hazardous drinkers in males than females. The researchers have demonstrated that in order to improve the test specificity and sensitivity, special cut-off points for males (5 or more for hazardous drinking) and females (3 or more) have shown to improve the assessment efficiency [6].

In a study conducted in Taiwan [7], the authors aimed to validate the Mandarin Chinese version of variable screening tools available. Over a 3-months period, all hospitalized patients, whether medical or surgical, were included unless very ill to be interviewed. 404 hospitalized patients were screened to detect hazardous drinkers. They used 7 screening tools, including AUDIT, AUDIT-C, AUDIT-4, AUDIT-3, TWEAK, SMAST and CAGE. The results were blindly compared with gold standard which was "the alcohol-related section of the Schedule for Clinical Assessments in Neuropsychiatry (SCAN) version 2.1 (WHO)". These results are similar to other studies conducted in other western countries, e.g. USA [5], [7].

In a meta-analysis of 14 studies extending over the period between 1998 and 2008, the strength of AUDIT and AUDIT-C assessment tools has been compared. They did not find a statistically significant difference between the full AUDIT version and its abbreviation (AUDIT-C) in the primary care setting regarding the detection of hazardous drinkers [8].

Several NHS trusts currently use AUDIT and AUDIT-C routinely. For example, West Sussex NHS Trust depends on AUDIT in all settings. They also used AUDIT-C for accident and emergency service users [9]. The Blackpool, Fylde and Wyre Hospitals NHS Foundation Trust is another trust which uses AUDIT-C routinely [10].

Last year, the Department of Health and the Public Health England released "The NHS Health Check Programme, best practice guidance". They established recommendations for alcohol risk assessment and alcohol care management plan.

These recommendations endorsed the AUDIT screening instrument. The Department of Health and Public health England recommended that the assessment can be split into 2 stages: a) an initial screen to identify those who may be at risk using AUDIT-C tool, and; b) second phase to identify the level of risk [11].

III. Aims

Efficient screening and brief intervention should be offered to all hospitalized patients in order to allow patients at risk of alcohol misuse the opportunity to improve the quality of care received and reduce the occurrence of avoidable complications. For that reason, it was decided to audit our alcohol history documentation and screening for hazardous drinkers at STH to identify any potentials for enhancing our clinical practice. This included three objectives. Firstly, to assess the alcohol intake documentation and whether the CAGE questionnaire currently incorporated in the clerking notes is being applied to newly admitted patients. Secondly, to compare the percentage of harmful drinkers as identified by CAGE questionnaire versus AUDIT-C. And finally, to examine whether hazardous drinkers receive any form of advice or education.

IV. Audit Standards

According to NICE guidelines "NHS professionals should routinely carry out alcohol screening as an integral part of practice". They also recommend that "all staff working in the NHS who care of people who potentially misuse alcohol should be competent to identify harmful drinking and alcohol dependence and to assess the need for intervention. If they are not competent, they should refer people who misuse alcohol to a service that can assess this need" [3].

V. Methods

Patients who have been post taken (reviewed by consultant physician) in the MAU at NGH were eligible for inclusion. Convenient sampling, a non-probability sampling technique, was used to recruit the patients on random days of the week over the period January-March 2015. Patients were asked for their verbal approval to participate in the Audit. Patients were excluded if they suffered from severe dementia, critically illness, confusion, or if the patient declined to participate.

Data collection and interviews were conducted by three medical doctors. The data collected from the notes included; 1) Alcohol intake documentation (the units per weeks); 2) CAGE questionnaire documentation (CAGE questionnaire is the default tool incorporated in current medical history clerking sheets); and 3) Any intervention or advice documented. The above documentation was then re-assessed by data collectors who repeated the alcohol history taking for each of the included patients using both CAGE questionnaire and AUDIT-C screening tool. Medical history (accessed via discharge summaries) and brain imaging reports from ICE system were reviewed for all patients.

VI. Results

Eighty-two subjects were included in this audit, 47 (57%) were male. The age of the sample ranged between was 23-102 with a mean of 75 years. Most of the patients had medical problems not related to alcohol intake while patient with alcohol related problem were only a minority (Table I).

Only 58 (71%) subjects have their alcohol intake clearly documented in the clerking sheets, Fig. 1. The alcohol intake as units per week documentation in 5 out of the 58 patients was inaccurate (8%).

The alcohol intake documentation in the notes revealed that 24 patients were drinkers with alcohol units ranged between 0.5 – 126 units /week. Only 4 patients have the CAGE questionnaire applied in the medical clerking sheets. None of the patients who required advice or education interventions regarding their alcohol intake had any documented verbal advice, leaflet or Alcohol Liaison Team referral. This data was re-assessed by the data collectors who asked the sampled patients regarding their alcohol intake in a short interview.

CAGE questionnaire and AUDIT-C tool were applied to all included patients.

TABLE I
BASELINE CHARACTERISTICS OF THE INCLUDED PATIENTS

Total	**82**
Age (year), median (IQR)	**75 (54-84)**
Sex	
Female, n (%)	**35 (42.7)**
Male, n (%)	**47 (57.3)**
Presenting Complaint	
Respiratory (Pneumonia, Exacerbation of Asthma & COPD)	**21**
Cardiac (Acute Coronary Syndrome, Arrhythmias, CCF)	**12**
Fall / recurrent falls	**10**
Alcohol excess / withdrawal	**9**
Renal (Urinary Tract Infection, Acute Kidney Injury)	**8**
Drug Overdose	**6**
Gastrointestinal (GI bleeding, Ascites)	**6**
Neurological (CVA, Migraine)	**5**
Musculoskeletal	**3**
Haematological	**2**

The interviews revealed that 42 (51.2%) out of 82 patients were found to drink alcohol (0.5-140 units/week). Nine patients were identified as hazardous drinkers among all the screened patients by the CAGE questionnaire.

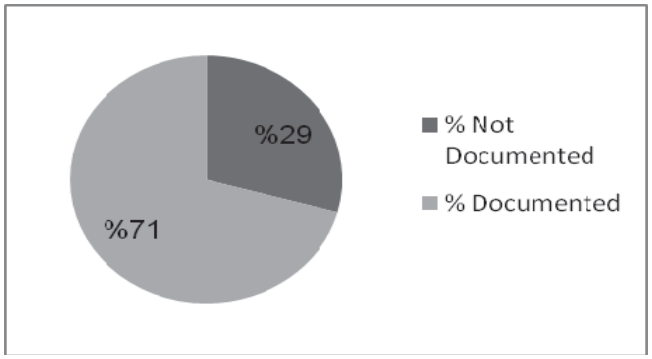

Fig. 1 Documentation of Alcohol history in clerking sheets

However, 25 patients were recognized as hazardous drinkers by AUDIT-C screening tool. Therefore, AUDIT-C tool had identified 30% of patients admitted to the MAU as hazardous drinkers including the patients already identified by CAGE, which was around 11%, Fig. 2. Alcohol consumption, as recorded by the investigators correlated strongly with the score of AUDIT-C (Pearson correlation 0.83) and less strongly with the CAGE score (r=0.71).

The younger the admitted patients, the higher the amount of alcohol they tend to consume (p=0.065). However, consumption was not significantly different in men and women. None of the 25 of patients with hazardous drinking by AUDIT-C were offered verbal advice, leaflet or Alcohol Liaison Team referral.

14 of the 25 patients with hazardous drinking by AUIDIT-C had a brain imaging (either CT or MRI) done for different reasons. 8 out of the 13 (53.8%) have signs of brain damage. Of the 57 nonhazardous drinkers, 18 had had CT/MRI scans and only 6 showed brain damages. However, presence of brain damage showed no association with either age or with alcohol consumption.

VII. DISCUSSION

Alcohol consumption was documented in around two-third of the patient sample. Although, this was documented reasonably accurately by health care professionals, the use of subjective words such as 'social drinking', 'occasional', or 'little' in the alcohol units' section of the history was common. CAGE questionnaire was applied to only four patients and none of the patients had documented advice, education or referral to an alcohol liaison team.

The results showed that doctors who uses CAGE questionnaire routinely are a minority. Less than one fifth of patients who drink alcohol were actually screened for hazardous drinking.

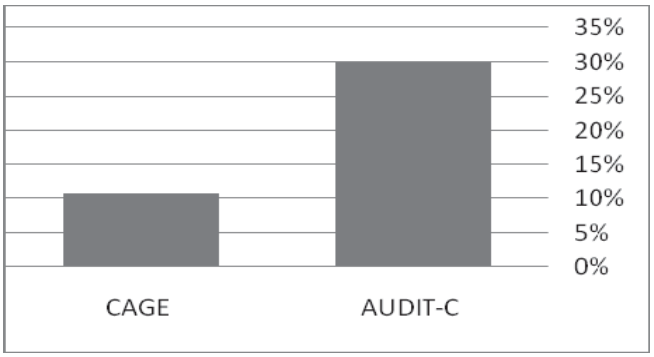

Fig. 2 The percentage of patients identified as hazardous drinkers when CAGE and AUDIT-C were applied appropriately

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AUDIT-C tool identified around three times more hazardous drinkers than CAGE questionnaire including those recognized as hazardous drinkers by CAGE questionnaire. This confirms the evidence that AUDIT-C tool is more sensitive than CAGE questionnaire [4],[6].

The results showed that the AUDIT-C score is directly proportional to the amount of alcohol the patient consumes per week to a higher degree compared to CAGE even if applied satisfactorily. Around three quarters of patients identified as hazardous drinkers by AUDIT-C have already been affected by alcohol use disorders. Therefore, effective recognition and early intervention is of prime importance to prevent alcohol use disorders in a considerable number of at risk drinkers.

The evidence also suggests that patient with AUDIT-C score 5 or more and/or CAGE score 2 or more are deemed harmful drinker. Those should receive advice directly from doctors, given leaflet or referred to alcohol liaison team. However, our results showed that none of the patients that fall in the above category received advice regarding their drinking.

It is important to acknowledge the limitation of this Audit. This is a single site audit with a small sample size. It is also

possible that some of the excluded patients (refused to be interviewed, confused) might potentially be hazardous drinkers. Convenience sampling can result in selection bias; however, the data collectors were keen to include a wide range of patients to allow accurate analysis of the results.

VIII. Conclusion

Alcohol misuse screening is not adequately undertaken and no appropriate action is being offered to hazardous drinkers. CAGE questionnaire is poorly applied to patients and when satisfactory and adequately used has low sensitivity to detect hazardous drinkers.

IX. Recommendation

Alcohol history taking and documentation by junior physicians requires further improvement. AUDIT-C tool is suggested to be integrated with the current medical history notes as it has been incorporated in several trusts across the UK. A trial of introducing AUDIT-C tool to clerking sheets is currently being audited. This may enhance alcohol history documentation and identification of hazardous drinkers. The use of AUDIT-C can provide more accurate picture of alcohol use and is recommended by NICE guidelines.

Junior doctors should be familiarized to record alcohol history appropriately and to give education/intervention advice to relevant patients through a brief teaching session incorporated to their induction training. Re-audit of alcohol practices is required after integration of AUDIT-C tool in patient clerking sheets.

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