Validation of the 8-item questionnaire for verifying stroke free status with and without pictograms in three West African languages

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ABSTRACT

Background: The Questionnaire for Verifying Stroke-free Status (QVSFS) has been validated in Western populations as a method for verifying stroke-free status in participants of clinical, epidemiological and genetic studies. This instrument has not been validated in low-income settings where populations have limited knowledge of stroke symptoms and literacy levels are low.
Objective: To simultaneously validate the 8-item QVSFS in 3 languages spoken in West Africa (Yoruba, Hausa and Akan) for ascertainment of stroke-free status of control subjects in SIREN.
Methods: Using a cross-sectional study design, 100 participants each from the 3 linguistic groups will be consecutively recruited from neurology and general medicine clinics of 5 tertiary referral hospitals in Nigeria and Ghana. Ascertainment of stroke status will be determined by neurologists using structured neurological examination, review of case records and neuro-imaging (Gold standard). The relative performance of QVSFS without and with pictures of stroke symptoms (pictograms) will be assessed using sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV).
Conclusion: The proposed study will provide valuable data on the performance of the QVSFS in resource-limited settings.

1. Introduction

There is an epidemic of stroke in low and middle-income countries due to rapidly increasing prevalence of vascular risk factors such as hypertension, diabetes mellitus, dyslipidaemia [1,2]. The need has thus arisen to conduct studies aimed at epidemiologic, genetic and phenotypic characterisation of stroke in sub-Saharan Africa to provide evidence-based information to confront this menace. To this end, it is important that controls selected for comparison with cases are recruited with a high degree of certainty that they indeed do not have stroke or TIA to allow for valid comparisons to be made. In view of this simple, quick and accurate assessment of symptoms of stroke is needed for epidemiologic studies particularly those of the case–control type.

In 2000, Meschia et al. developed the Questionnaire for Verifying Stroke-free Status (QVSFS) as a method for verifying the stroke-free phenotype in participants of clinical, epidemiological and genetic studies [3]. Having one or more affirmative answers to any of the questionnaire was associated with finding stroke, TIA, or either stroke or TIA on medical record review [3]. Jones et al. showed by directly interviewing participants and review of medical records that the QVSFS had a NPPV and PPV of 0.96 and 0.71 respectively making the 8-item QVSFS a sensitive and valid tool [4], and a structured telephone interview format of questionnaire administration still had an excellent sensitivity of 1.0, specificity of 0.86, positive predictive value of 0.36 and negative predictive value of 1.0 among participants aged 60 years and above. The QVSFS is also reliable with intra-rater and inter-rater agreement of stroke-free status classification of 0.90 and 0.94 respectively [5]. The QVSFS is easy

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to administer as a self-report pencil-and-paper questionnaire or by an interview in person or by telephone and has been translated into Spanish by Castillo et al. for use among Hispanic populations [6].

Two questions in the instrument assess previous diagnosis of either stroke/TIA together with six questions about stroke symptoms. Thus not only is the 8-item QVSFS a useful tool in identifying stroke-free individuals but it could be used to screen for undiagnosed stroke. The sensitivity and specificity of having any of the six symptom questions for stroke detection was 0.82 and 0.62 respectively [7]. Indeed the QVSFS has been successfully used in the recruitment of controls involved genetic studies into ischaemic stroke [8,9], to screen for cerebrovascular end points in the Carotid Revascularisation Endarterectomy versus Stent Trial (CREST) [10] and in the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study [11].

This instrument could have tremendous potential in developing countries where stroke prevalence is increasing, awareness of stroke symptoms low and the confirmation of stroke diagnosis either missed by health workers or constrained by the pervasive lack of neuro-imaging modalities. In these low literacy settings the lack of knowledge of stroke symptoms might impact negatively on the performance of stroke symptom questionnaires. Furthermore there is a lack of specific medical terminology for symptoms of stroke in local dialects across sub-Saharan Africa. The performance of the questionnaire could be enhanced further by the introduction of culturally acceptable pictures of stroke symptoms. Hence the performance of the 8-item QVSFS needs validation in developing countries.

One of the key comments regarding the 8-item QVSFS questionnaire is that the benchmark for verification of strokes has relied on review of medical records of patients but this approach may be problematic in settings where medical records are kept under less than optimal circumstances and where patients may not always seek health services for ailments from medical facilities but from herbalists, chemical shops and so forth. An approach to overcome this limitation would be to examine participants by neurologists or to use a cranial CT scan for verification in a subset of participants. This study seeks to validate the 8-item QVSFS at 5 centers in Nigeria and Ghana which are involved in the on-going NIH supported Stroke Investigative Research and Educational Networks (SIREN) study.

2. Methods

2.1. Study sites

Participants will be recruited from five Tertiary referral medical centers in West Africa namely the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana; the University College Hospital (UCH), Ibadan, Nigeria; Federal Medical Centre (FMC), Abeokuta, Nigeria; Ahmadu Bello University Hospital (ABUH), Zaria, Nigeria and Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria (Fig. 1). Kumasi where KATH is situated is the principal city of the Akan tribe in central Ghana and serves a population of 4 million. The Akan language is spoken by 50% of the Ghanaian population. UCH and FMC situated in Ibadan and Abeokuta respectively are located in Southern Nigeria and serve a combined population of 4 million Nigerians of predominantly Yoruba ethnicity. Yoruba is a trans-border language spoken by 30 million Nigerians. ABUH and AKTH in Zaria and Kano provide health care services to 15 million Nigerians of mainly Hausa and Fulani descent. All these study sites have consultant
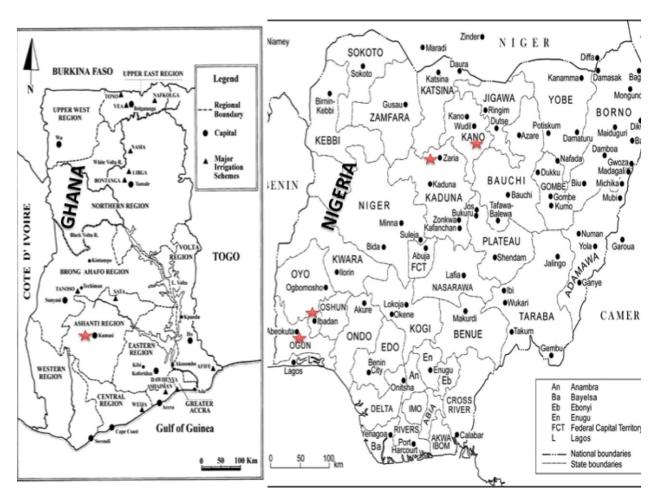

Fig. 1. Map showing 5 study sites (indicated by red stars).