A novel, simple scale for assessing the symptom severity of atrial fibrillation at the bedside: The CCS-SAF Scale

Paul Dorian MD MSc¹, Suzan S Cvitkovic MSc¹, Charles R Kerr MD², Eugene Crystal MD³, Anne M Gillis MD^{4,5}, Peter G Guerra MD⁶, L Brent Mitchell MD⁴, Denis Roy MD⁶, Allan C Skanes MD⁷, D George Wyse MD PhD⁴

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BACKGROUND: The severity of symptoms caused by atrial fibrillation (AF) is extremely variable. Quantifying the effect of AF on patient well-being is important but there is no simple, commonly accepted measure of the effect of AF on quality of life (QoL). Current QoL measures are cumbersome and impractical for clinical use.

OBJECTIVE: To create a simple, concise and readily usable AF severity score to facilitate treatment decisions and physician communication.

METHODS: The Canadian Cardiovascular Society (CCS) Severity of Atrial Fibrillation (SAF) Scale is analogous to the CCS Angina Functional Class. The CCS-SAF score is determined using three steps: documentation of possible AF-related symptoms (palpitations, dyspnea, dizziness/syncope, chest pain, weakness/fatigue); determination of symptom-rhythm correlation; and assessment of the effect of these symptoms on patient daily function and QoL. CCS-SAF scores range from 0 (asymptomatic) to 4 (severe impact of symptoms on QoL and activities of daily living). Patients are also categorized by type of AF (paroxysmal versus persistent/permanent). The CCS-SAF Scale will be validated using accepted measures of patient-perceived severity of symptoms and impairment of QoL and will require 'field testing' to ensure its applicability and reproducibility in the clinical setting.

CONCLUSIONS: This type of symptom severity scale, like the New York Heart Association Functional Class for heart failure symptoms and the CCS Functional Class for angina symptoms, trades precision and comprehensiveness for simplicity and ease of use at the bedside. A common language to quantify AF severity may help to improve patient care.

Key Words: Atrial fibrillation; Health outcomes

Une échelle simple et nouvelle pour évaluer la gravité des symptômes de fibrillation auriculaire au chevet du patient : L'échelle de GFA de la SCC

HISTORIQUE : La gravité des symptômes causés par la fibrillation auriculaire (FA) est extrêmement variable. Il est important de quantifier l'effet de la FA sur le bien-être du patient, mais il n'existe pas de mesure couramment acceptée pour mesurer l'effet de la FA sur la qualité de vie (QV). Les mesures de QV actuelles sont encombrantes et peu pratiques pour un usage clinique.

OBJECTIF : Créer une échelle de gravité de la FA à la fois simple, concise et commode pour faciliter les décisions de traitement et les communications entre médecins.

MÉTHODOLOGIE : L'échelle de gravité de la fibrillation auriculaire (GFA) de la Société canadienne de cardiologie (SCC) est analogue à l'échelle d'angine de la SCC. L'échelle de GFA de la SCC est déterminée au moyen de trois étapes : documentation des symptômes pouvant être reliés à la FA (palpitations, dyspnée, étourdissements ou syncope, douleurs thoraciques, faiblesse ou fatigue), détermination de la corrélation entre les symptômes et le rythme et évaluation de l'effet de ces symptômes sur la fonction quotidienne et la QV du patient. Les échelles de GFA de la SCC oscillent entre 0 (asymptomatique) et 4 (graves répercussions des symptômes sur la QV et les activités de la vie quotidienne). Les patients sont également classés selon le type de FA (paroxysmique par rapport à persistante ou permanente). L'échelle de GFA de la SCC sera validée à l'aide de mesures acceptées de gravité des symptômes et d'atteinte à la QV perçues par le patient et exigera des « essais sur le terrain » pour en garantir l'applicabilité et la reproductibilité en milieu clinique.

CONCLUSIONS : Ce type d'échelle de gravité des symptômes, tel que la classe fonctionnelle des symptômes d'insuffisance cardiaque de la *New York Heart Association* et la classe fonctionnelle de symptômes d'angine de la SCC, troque la précision et la perspective d'ensemble contre la simplicité et la facilité d'usage au chevet du patient. Un langage commun pour quantifier la gravité de la FA pourrait contribuer à améliorer les soins aux patients.

¹Division of Cardiology, St Michael's Hospital and the University of Toronto, Toronto, Ontario; ²Division of Cardiology, St Paul's Hospital and University of British Columbia, Vancouver, British Columbia; ³Division of Cardiology, Sunnybrook and Women's College Health Science Centre and the University of Toronto, Toronto, Ontario; ⁴Libin Cardiovascular Institute of Alberta and Departments of Cardiac Sciences/Medicine, University of Calgary, Calgary, Alberta; ⁵Alberta Heritage Foundation for Medical Research, Edmonton, Alberta; ⁶Division of Cardiology, Montreal Heart Institute and University of Montreal, Montreal, Quebec; ⁷Division of Cardiology, London Health Sciences Centre and University of Western Ontario, London, Ontario

Correspondence: Dr Paul Dorian, St Michael's Hospital, Division of Cardiology, 30 Bond Street, 6-050Q, Toronto, Ontario M5B 1W8.

Telephone and fax 416-864-5104, e-mail dorianp@smh.toronto.on.ca

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Because of its high incidence and the considerable disability that it may generate, atrial fibrillation (AF) is increasingly recognized as an important clinical problem in medical practice. Recent clinical trials comparing the restoration and maintenance of sinus rhythm ('rhythm control' strategy) and the control of ventricular response rate ('rate control' strategy) for the treatment of AF have suggested that the only potential advantage of the rhythm control strategy over the rate control strategy, in patients such as those enrolled in the trials, is its potential to improve symptoms related to AF (1). The primary purpose of any therapy in AF is to improve patient well-being. This finding has highlighted the importance of quickly and efficiently assessing the impact of AF on patient quality of life (QoL) to make appropriate and informed decisions with respect to the risks and benefits of the various therapies available.

Guidelines for the management of AF rely heavily on the degree of symptoms in selecting the strategy of rhythm control versus rate control (2).

In spite of the recommendations of the guidelines, no simple or widely accepted metric exists that allows a bedside estimation of the impact of AF symptoms on well-being and QoL of a specific patient. A number of questionnaires, generally used for research purposes, have been developed to assess these variables in patients with AF. They consist of both disease-specific questionnaires (such as the University of Toronto AF Severity Scale [3] and AF Symptom Checklist [4]) and validated generic health-related QoL questionnaires (such as the Short Form-36 questionnaire [5]). Although these questionnaires appear to validly and reproducibly estimate patient-perceived QoL of patients with AF, they are not suitable for everyday clinical use because they require questionnaire completion and detailed scoring.

Importantly, the severity of arrhythmia-related symptoms is not the only determinant of the integrated effect of the AF syndrome on QoL. A patient's psychological characteristics (6) and a treatment's adverse effects also influence QoL; thus, a severity scale needs to assess not only symptoms themselves, but also their impact on overall patient well-being.

Members of the Primary Panel of the Canadian Cardiovascular Society (CCS) Consensus Conference on AF (2) have attempted to develop a simple, concise, symptom-based severity scale for routine clinical use in patients with AF, analogous to the well-known and useful CCS Angina Functional Class, and the New York Heart Association (NYHA) Functional Class Scale.

The CCS Severity of AF (CCS-SAF) Scale provides a clinically useful scale intended to be used by practitioners to assess a patient's status and suitability for therapies with well-defined risks, to follow patient treatment responses over time and to communicate with other practitioners about symptom severity. This scale attempts to balance simplicity, precision and comprehensiveness with simplicity to enhance utility at the bedside.

METHODS

The process of using this scale begins with the identification of the chief AF symptoms in the patient being evaluated: palpitations, dyspnea, dizziness (presyncope or syncope), chest pain and weakness/fatigue. Secondly, an association is determined between the patient's symptoms and the documented occurrence of AF, thus establishing a symptom-rhythm correlation. Once the symptoms and their associations with the presence of AF are established, their effects on QoL and well-being can be assessed (Figure 1).

Details of the proposed CCS-SAF Scale are presented in Figure 2. One of the major challenges in developing this scale was to devise a single scoring system that would be useful for patients with paroxysmal AF and for those with persistent or permanent AF. These different forms of AF may have different manifestations. Furthermore, the episodic nature of paroxysmal AF requires evaluation of the frequency of symptomatic episodes when quantifying the symptom status of an individual patient.

AF classification is useful for making decisions about therapy but is itself problematic. The designation of four types of AF in a time-based clinical classification has been made popular by the guidelines outlined by the American College of Cardiology/American Heart Association/European Society of Cardiology (7), and has been supported by the recent CCS Consensus Conference on AF (2). However, the four categories (first documented, recurrent paroxysmal, recurrent persistent and permanent) can most readily be applied to only an individual episode of AF. The possibility of a fifth category (mixed) when attempting to categorize a particular patient is recognized in the American College of Cardiology/American Heart Association AF data standards (8). However, the classification of AF, or of a patient with AF, is fundamentally different than assessment of the severity of symptoms, although the two are inextricably linked. Persistent AF may recur at varying intervals; as such, frequency of symptoms by itself does not refer only to paroxysmal AF. Furthermore, patients (and their physicians) are often inaccurate in knowing when they are in AF and in their estimates of episodic frequency/duration (3). For example, most patients with persistent or permanent AF do not have continuous symptoms, and many with symptomatic paroxysmal AF have as many or more asymptomatic episodes than symptomatic ones (9).

After much discussion at the CCS Consensus Conference, the working group assigned to develop a system to quantify symptoms decided that the most prudent approach was to combine quantification of symptoms and QoL with the classification of the predominant pattern of AF.

Included below is a brief description of severity and frequency of symptoms and subjective effect of AF on QoL that was thought to best represent each of the different scores (from 0 to 4). The scheme requires that this score be qualified by stating the patient's classification with respect to the type of AF (for example, CCS-SAF class 2, paroxysmal AF, indicating the frequency and severity of symptoms and the predominant type of AF, or CCS-SAF class 0, persistent AF, for asymptomatic patients in whom AF persists but has not been declared 'accepted' or permanent).

The scale makes the important distinction between symptoms attributable to AF itself and the effects of these symptoms on well-being. The scale is intended to do the latter, that is, to assess the impact of symptoms of AF on the patient's perceived well-being. This distinction makes the scale unambiguously subjective but captures the clinical problem. For example, a patient with intermittent AF (whether paroxysmal or persistent) may be in sinus rhythm at the time of evaluation and completely asymptomatic, but the patient's QoL and well-being can clearly be severely affected by the disorder regardless of the absence of symptoms at the moment of evaluation. The scale also accommodates quantification of adverse effects due to treatment. For example, if a patient has persistent AF, severe palpitations and is in CCS-SAF class 3, persistent AF, then he/she may be treated with an aggressive rate control approach if the AF is accepted/permanent. This therapy may completely relieve the palpitations, but may cause severe cold hands, sleep disturbance and sexual dysfunction; the patient

Step 1 – Symptoms
Identify the presence of the following symptoms:
A. Palpitation
B. Dyspnea
C. Dizziness, presyncope, or syncope
D. Chest pain
E. Weakness or fatigue
Step 2 – Association
Is AF, when present, associated with the above-listed symptoms (A-E)?
For example: Ascertain if any of the above symptoms are present during AF and likely caused by AF (as opposed to some other cause).
Step 3 – Functionality
Determine if the symptoms associated with AF (or the treatment of AF) affect the patient's functionality (subjective quality of life).

Figure 1) The three steps of the Canadian Cardiovascular Society Severity of Atrial Fibrillation (AF) Scale

would, strictly speaking, not have AF symptoms anymore but could still be in CCS-SAF class 3, permanent AF, if these side effects are equally bothersome as the symptoms directly attributable to AF (the aim is to enable the scale/class to be a guide to treatment).

It should be noted that electrocardiogram-documented AF is poorly correlated with symptoms of AF, and that the presence and severity of symptoms has a variable effect on patient subjective-QoL. The scale recognizes that the most important variable is the overall effect of the rhythm disorder or its treatment on patient well-being.

For the purposes of this scale, 'paroxysmal AF' is defined as AF that spontaneously reverts to sinus most or all of the time, without intervention. 'Persistent AF' is AF that only reverts to sinus after drug therapy or cardioversion. Further subdivision can be made on the basis of whether the patient is considered to be in permanent AF (no effort, or no further effort, to restore sinus rhythm) and is presenting with their first documented episode of AF or has an equal number of paroxysmal and persistent episodes (mixed category). Intermittent symptoms can occur with any type of AF because this classification refers to subjective symptoms and not the rhythm status itself. The scale can be applied regardless of whether the patient is in AF at the time of assessment.

Unlike the CCS Angina Functional Class, which refers to the patient's status at the time of assessment, QoL-related assessments of AF generally require longer periods of time over which the scale is integrated. Although there cannot be specific rules concerning these time periods, it is recognized that for most patients, their subjective assessments will encompass the preceding period of four weeks or more. If the symptom frequency is low, then the assessment may need to integrate a longer period of up to several months.

DISCUSSION

The CCS-SAF Scale is in the process of being validated using accepted measures of patient-perceived symptom severity and QoL impairment. Preliminary results indicate that this scale is valid and reliable to estimate the degree to which AF impairs QoL (10). This type of symptom severity scale, like the NYHA Functional Class for heart failure symptoms and the CCS Functional Class for angina symptoms, trades precision and

Class 0
Asymptomatic with respect to AF
Class 1
Symptoms attributable to AF have minimal effect on patient's general QoL.
<ul style="list-style-type: none"> • minimal and/or infrequent symptoms, or • single episode of AF without syncope or heart failure
Class 2
Symptoms attributable to AF have a minor effect on patient's general QoL.
<ul style="list-style-type: none"> • mild awareness of symptoms in patients with persistent/permanent AF, or • rare episodes (eg, less than a few per year) in patients with paroxysmal or intermittent AF
Class 3
Symptoms attributable to AF have a moderate effect on patient's general QoL.
<ul style="list-style-type: none"> • moderate awareness of symptoms on most days in patients with persistent/permanent AF, or • more common episodes (eg, more than every few months) or more severe symptoms, or both, in patients with paroxysmal or intermittent AF
Class 4
Symptoms attributable to AF have a severe effect on patient's general QoL.
<ul style="list-style-type: none"> • very unpleasant symptoms in patients with persistent/paroxysmal AF and/or • frequent and highly symptomatic episodes in patients with paroxysmal or intermittent AF and/or • syncope thought to be due to AF and/or • congestive heart failure secondary to AF

Figure 2) Class definitions of the Canadian Cardiovascular Society Severity of Atrial Fibrillation (AF) Scale, ranging from 0 to 4. QoL Quality of life

comprehensiveness for simplicity and ease of use at the bedside. Although the NYHA and CCS classes do not precisely correlate with functional capacity, exercise capacity or severity of structural heart disease, they have stood the test of time as useful and appropriate measures to assist clinicians in communicating with each other using a common language through which the effectiveness of therapies and outcomes can be readily measured. This new CCS-SAF Scale is offered in the same spirit.

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