THE 2019 ESC GUIDELINES ON SUPRAVENTRICULAR TACHYCARDIA: WHAT ARE THE MESSAGES?

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At the 2019 European Society of Cardiology (ESC) congress held in Paris, France (August 31–September 4), the new guidelines on the management of supraventricular tachycardia (SVT) were presented, which were authored by a group of experts from Europe and North America.[1] It is noteworthy that the delay between these European guidelines and the previous guidelines was 16 years, which probably indicated a relatively modest attitude from the scientific community about providing new evidence in this field, even if a consensus document was quite recently delivered by the European Heart Rhythm Association.[2]

In fact, the epidemiological impact of SVT in clinical practice is important, with an estimated prevalence in the general population of 2.25 per 1000 people and an incidence of 35 per 100 000 person-years. Women have a 2-fold higher risk, as compared with men, of developing SVT. In addition, SVT should not be considered a disease affecting only young people, as is the common belief, since the elderly (age 65 years or older) have more than a 5-fold risk of developing SVT than younger individuals. In an epidemiological view, it should also be stressed that SVT may occur in pediatric individuals, which may imply a risk of sudden cardiac death (eg, Wolff-Parkinson-White syndrome) that needs to be properly evaluated considering the possibility of a curative approach with ablation.

The occurrence of SVT episodes in the community induces a burden of acute admission to emergency departments for acute treatment, as well as to the cardiology wards for diagnostic and therapeutic clinical evaluations, which strongly suggests the need for an updated and authoritative re-evaluation of the best diagnostic and therapeutic resources currently indicated for the treatment of SVT in both acute and long-term cases, as provided in these guidelines.[1]

An analysis, even at first look, of the main changes in the level of evidence and in the strength of recommendations that characterize the 2019 SVT guidelines,

as compared with the previous 2003 guidelines, leads to the consideration that pharmacological treatments have clearly lost confidence, mainly for safety precautions, since a detailed reassessment of available evidence resulted (*Table I*) in a constant downgrading of the class of recommendations in these guidelines, either for acute and long-term pharmacological treatment, with currently only one class I recommendation for a pharmacological agent among the 51 class I recommendations delivered (41% of the overall 123 recommendations). In detail, this single class I recommendation for a pharmacological agent is for intravenous ibutilide for acute termination of atrial flutter.

In a general view of the distribution of the grading of recommendations for these 2019 guidelines, it emerges:

For the level of evidence (graded as A, B, or C):

- **Level A** (availability of multiple randomized control trials or methodology supporting the recommendation) was obtained for <2% of the recommendations (2/123).
- **Level B** (availability of a single randomized clinical trial or large nonrandomized studies) was obtained for 54% of the recommendations (66/123).
- **Level C** (result of a consensus of experts and/or small retrospective studies or registries) was obtained for 45% of the recommendations (55/123).

For the strength of recommendations (traditionally reported as class I, IIa, IIb, and III):

- **Class I** (evidence/agreement that a treatment is beneficial, useful, and effective) was obtained for 41% of the recommendations (51/123).
- **Class IIa** (evidence/opinion in favor of usefulness/effectiveness) was obtained for 37% of the recommendations (46/123).
- **Class IIb** (less established usefulness/effectiveness) was obtained for 15% of the recommendations (19/123).
- **Class III** (evidence/agreement that an intervention is not useful or effective or may even cause harm) was obtained for 6% of the recommendations (7/123).

In a more general view, taking into account guidelines delivered for other diseases, such as atrial fibrillation or acute coronary syndrome, it is noteworthy to stress that the proportion of recommendations with a level of evidence A is usually around 11% to 15%,[3-6] much higher than the 1.6% corresponding to only 2 recommendations with a level of evidence A found in these SVT guidelines.

Table I. *Comparison of the 2019 ESC guidelines for the management of supraventricular tachycardia with the 2003 ESC guidelines. Modified with permission from reference 1: Brugada J et al.* Eur Heart J. *2019 Aug 31.*

	Recommendation in the 2003 ESC guidelines	**Recommendation in the 2019 ESC guidelines**
Acute management of narrow QRS tachycardias		
β-Blockers	IIb	IIa
Verapamil/diltiazem	I	IIa
No longer mentioned in 2019		Amiodarone, digoxin
Acute management of wide QRS tachycardias		
Adenosine	IIb	IIa
Amiodarone	I	IIb
Procainamide	I	IIa
No longer mentioned in 2019		Sotalol, lidocaine
Therapy of inappropriate sinus tachycardia		
β-Blockers	I	IIa
No longer mentioned in 2019		Verapamil/ diltiazem, catheter ablation
Therapy of focal atrial tachycardia		
Acute treatment		
Amiodarone	IIa	IIb
β-Blockers	I	IIa
Flecainide/propafenone	IIa	IIb
No longer mentioned in 2019		Digoxin, procainamide, sotalol
Chronic treatment		
β-Blockers	I	IIa
Verapamil/ diltiazem	I	IIa
No longer mentioned in 2019		Amiodarone, disopyramide, sotalol

Table I. Continued

	Recommendation in the 2003 ESC guidelines	Recommendation in the 2019 ESC guidelines
Therapy of atrial flutter		
Acute treatment		
Atrial or transesophageal pacing	I	IIb
β-Blockers	I	IIa
Ibutilide	IIa	I
Flecainide/propafenone	IIb	III
Verapamil/diltiazem	I	IIa
No longer mentioned in 2019		Digoxin
Chronic treatment		
No longer mentioned in 2019		Disopyramide, dofetilide, flecainide, procainamide, propafenone, quinidine, sotalol
Therapy of atrioventricular nodal reentrant tachycardia		
Acute treatment		
No longer mentioned in 2019		Amiodarone, flecainide, propafenone, sotalol
Chronic treatment		
β-Blockers	I	IIa
Verapamil/ diltiazem	I	IIa
No longer mentioned in 2019		Amiodarone, flecainide, propafenone, sotalol, and the “pill in the pocket” approach
Therapy of atrioventricular reentrant tachycardia		
β-Blockers	IIb	IIa
Flecainide/propafenone	IIa	IIb
No longer mentioned in 2019		Amiodarone, sotalol, and the “pill in the pocket” approach

The limited innovation in the development of antiarrhythmic drugs is highlighted by the fact that only one new drug is currently in the premarket phase for the treatment of SVT, namely etripamil, a short-acting L-type calcium channel blocker with a rapid onset of action after intranasal administration, with conversion rates from SVT to sinus rhythm in the first clinical study ranging from 65% to 95%.[7] The SVT guidelines mention this treatment, which is interesting, novel, and promising, but cautiously do not provide any recommendation in view of the need for additional studies following the first phase 2 evaluation.

The guidelines stress the importance of the differential diagnosis of SVT with an appropriate recognition of the type of SVT and of the related mechanisms (focal, multifocal, macro-reentry, macro-reentry involving an accessory pathway, reentry within the atrioventricular node) as a crucial step for acute and long-term management of these arrhythmias, also with the perspective of a curative treatment with ablation. Even if the step-by-step analysis of a 12-lead ECG is of primary value in defining the type of SVT in case of either narrow QRS tachycardia (QRS ≤120 ms) or wide QRS tachycardia, the 2019 guidelines include a very practical approach for acute management, with specific recommendations also in cases where these arrhythmias still do not have an established diagnosis. Apart from the use of DC shock in case of hemodynamic instability, it is interesting and very practical to use intravenous adenosine for diagnostic purposes both in case of narrow and wide QRS tachycardia, provided that, in the latter case, an anterograde preexcitation is not present at the 12-lead ECG.

One of the most harmful settings among SVT is the occurrence of atrial fibrillation with overt preexcitation and these guidelines propose an important change compared with the previous guidelines by stressing that, in preexcited atrial fibrillation, intravenous amiodarone may not be as safe as previously thought because enhanced pathway conduction and degeneration in ventricular fibrillation has been reported in several cases, and therefore use of amiodarone in this setting should not be considered (recommendation of class III with a level of evidence B for intravenous amiodarone in the setting of preexcited atrial fibrillation).[8]

The recent SVT guidelines stress the efficacy of ablation and indicate that, in all reentrant and most focal arrhythmias, catheter ablation should be offered as an initial choice. The efficacy of ablation techniques, which the literature reports to be ≈97% for atrioventricular nodal reentrant tachycardia, ≈92% for atrioventricular reentry tachycardia, ≈95% for cavotricuspid dependent atrial flutter, and ≈85% for focal atrial tachycardia,[1] strongly support the predominant role that the interventional treatments gained in recent years. However, the guideline recommendations do not cover technical aspects, such as the type of energy[9] or the type of ablation catheters to be preferred in specific settings.

With regard to the delicate issue of the risk of thromboembolism and stroke associated with atrial flutter, the 2019 ESC guidelines clearly stress that "anticoagulation as in atrial fibrillation is recommended for patients with atrial flutter and concomitant atrial fibrillation" (class I recommendation, level of evidence B). In patients with atrial flutter without atrial fibrillation, the guidelines indicate that anticoagulation should be considered, but the threshold for the initiation of anticoagulation has not been established (class IIa recommendation, level of evidence C), thus implying that, if the risk of bleeding is not substantial, the same criteria for atrial fibrillation could be considered, in the absence of other suggestions.

SVT mainly occurs in patients with no or minimal heart disease, but may result in an important worsening of quality of life and may have a negative impact on recreational activities and sports activities and, in more severe cases, may be associated with syncope, also when driving. For these reasons, the principle that clearly inspired these guidelines is the "safety first" principle, to be applied from the time of acute treatment in the emergency department, thus avoiding drugs or interventions with potential risk, and to be subsequently applied for diagnostic as well as therapeutic interventions. The challenge now is to determine to what extent this principle, which should always inspire all fields of clinical medicine ("primum non nocere" is a well-known Hippocratic axiom), may be constantly applied in daily practice, where a gap in application and implementation of consensus guideline recommendations is frequently observed. In fact, it has been reported that 30% to 45% of patients may not actually be receiving evidence-based care with a proven benefit, and, on the contrary, 20% to 25% of care provided overall may not be justified or may even be potentially harmful.[10]

It is important to stress that, for any consensus guideline, the process of delivery of recommendations is just the first step of a virtuous circle that should include specific initiatives for guideline implementation, either for acute or chronic management, in all of the settings where SVT is managed (emergency departments, cardiology wards, outpatient clinics, internal medicine wards, and medical clinics where general practitioners visit outpatients). Monitoring of guideline implementation should include audits providing some feedback on potential barriers in the full application of the guidelines into real-world practice. This is, indeed, the right approach for instituting a "virtuous circle" connecting the field of clinical research with the field of clinical practice, thus leading to important suggestions on how to improve the organization of clinical care delivery,[10] In other words, the guidelines should be a bridge between clinical research and daily practice, but also with some reverse feedback on how to direct future clinical research on SVT, which, in view of the characteristics of this arrhythmia is frequently physician-initiated and not strictly industry-promoted. ■

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