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Opinions of cardiologists on class II recommendations in current European Society of Cardiology 2018-2020 guidelines: YELLOW BOX

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ABSTRACT

Objectives: We planned our survey study to evaluate the opinion of cardiologists about the class II recommendations on levels of evidence in the current European Society of Cardiology Guidelines (ESC). Our aim is to determine which diagnosis or treatment option most prefer by cardiologist when guidelines do not make clear recommendations.

Methods: The survey was conducted on September 2020 with the participation of cardiologists (n = 102). Our survey covers ESC's guidelines published in 2018-2020 on diagnosis and treatment strategies in coronary artery disease, diabetes, heart valve disease, arrhythmia, dyslipidemia and heart failure. Our survey consisting of 40 questions was shared with the cardiologists via e-mail.

Results: Participants answered all of the survey questions. The majority of the participants (79.41%) did not consider the addition of a second long-term antithrombotic medication in addition to aspirin for secondary prevention in diabetes mellitus (DM) and coronary artery disease (CAD) patients who are not at high risk of bleeding. The lowest low density lipoprotein (LDL) value achieved by the participant physicians with treatment in their practices was < 40 mg/dl in 32 (31.37%) participants. One of the striking results of the survey was that 51.96% of the participants stated that it was not possible to measure the lipoprotein a (Lp(a)) level in the center where they were carrying out their practices, and 34.31% did not consider the Lp(a) level in the treatment of dyslipidemia in terms of directing the treatment. As for patients with asymptomatic Wolff-Parkinson-White (WPW) syndrome, 58.82% of the participants considered catheter ablation therapy.

Conclusions: Although there were different opinions on some recommendations, the participants were mostly in agreement. We think that these survey results, which were mostly based on expert opinions, may contribute to the guidelines to be published in the future with the increase of survey studies on these issues.

Keywords: ESC guidelines, class II, cardiovascular disease.

Cardiovascular diseases (CVD) are still the main preventable cause of morbidity and all-cause mortality worldwide and in our country [1]. The risk of developing CVD increases with other risk factors such as older age, obesity, smoking, hypertension (HT), hypercholesterolemia, and diabetes mellitus (DM) [2]. First and foremost, these diseases should be prevented and risk factors controlled. There is multi-

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tude of evidence suggesting that early treatment with recommended therapies can significantly reduce morbidity and mortality [3, 4]. For this reason, the awareness, advice and consensus of cardiologists on coronary artery disease (CAD), HT, dyslipidemia and DM are important in the prevention and treatment of the disease.

Trials and guidelines are needed to guide for cardiologists on these issues. In the recent years, substantial progress has been made in the diagnosis and treatment of CVD. The European Society of Cardiology (ESC) guidelines provide many recommendations for the prevention, diagnosis and treatment of CVD. The guidelines describe Class I, II and III recommendations. Class II recommendations cover conditions which there is conflicting evidence and/or divergence of opinion about the usefulness, and efficacy of a given treatment or procedure [1-6]. Class recommendations of the guidelines are changing and are revised in line with the developments of diagnosis and treatment, also with new studies. The consensus of cardiologists about class II recommendations of ESC guidelines on levels of evidence regarding CAD, HT, DM and dyslipidemia is important. Surveys help us verify that diagnostic and treatment practices for CVD comply with the guidelines recommended. Therefore, we planned our survey to evaluate approach of cardiologists in their clinical practice on the class II recommendations in the current ESC guidelines.

METHODS

Our study targeted cardiologists working at university hospitals, state hospitals, education and research hospitals, private hospitals and medical centers in the seven geographical regions of Turkey. This study was targeted out on September 2020 with the participation of cardiologists (n = 102).

The survey was shared with the cardiologists via e-mail. 103 cardiologist received our survey and 102 (99.03%) cardiologist answered all the questions of the survey. The survey, consisting of 40 questions, was conducted to evaluate the awareness of cardiologists on approaches to cardiovascular diseases in class II recommendations in the ESC guidelines. Questions were selected based on the guideline recommendations that are frequently discussed in daily practice. Our survey covers topic regarding the diagnosis and treatment strategies in CAD, DM, valvular heart disease, arrhythmia, dyslipidemia and heart failure (HF). In our survey, questions were prepared by taking into account class II recommendations in the 2019 ESC dyslipidemia guidelines [3], 2019 ESC diabetes, prediabetes and cardiovascular diseases guidelines [4], 2019 ESC supraventricular tachycardia guidelines [5], 2019 chronic coronary syndrome (CCS) guidelines [6] and class II recommendations in the 2020 ESC sports cardiology guidelines [7], 2020 ESC atrial fibrillation guidelines [8], 2020 ESC adult congenital heart disease guidelines [9], and 2020 ESC Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation Guidelines [10]. Survey questions were answered online by the participants.

Ethics committee approval of our study was received from Ufuk University School of Medicine Non-Interventional Clinical Research Commission with date and number 20200521/3.

The study period was determined as 3 (three) months, and at the end of this period, survey data were collected through the Survey Monkey survey research site which uses an internet database from physicians who voluntarily completed the questionnaire. The answers of a cardiologist who completed the questionnaire, but did not approve the use of the data for scientific purposes, was excluded from the analysis. Survey data from the other 102 (99.03%) cardiologists who gave their consent were included in the analysis.

Statistical Analysis

IBM SPSS Statistics 25.0 Program was used. Categorical variables are given as numbers (n) and percentages (%). G Power 3.1.9.7 programme was done for the sample size calculation. Estimated sample size was calculated using Student's-t test with 80% power, $\alpha = 0.05$ error level and Cohen (d) effect size = 0.3. Accordingly, it was found appropriate to complete the study with at least 100 participants.

RESULTS

Of the participants, 13 (12.75%) were under the age of 30, 81 (79.41) were between the ages of 30-45, and 8 (7.84%) between the ages of 46-65. There were no participants over the age of 65. The male gender was

dominant in our survey (male: 84.31%, female: 15.69%). There were 29 (28.43%) participants who worked as a cardiologist for less than 5 years and 46 (45.10%) participants who worked as a cardiologist for 5 to 10 years. When look at the institutions where participants work, state hospitals ranked first with 55.88%, whereas university hospitals ranked second with 36.27%. The percentage of cardiologists who examined 60 or more out-patients daily was 35.29%, and the proportion of cardiologists who examined 41-60 - out-patients daily was 32.35%. The proportion of cardiologists who examined 20 out-patients or less was 12.75% (Figs. 1 and 2).

We grouped the results of our survey under the headings of diabetes and cardiovascular system, cardiovascular prevention and diagnosis, CAD, dyslipidemia, arrhythmia, valvular heart disease, and HF. We specified the responses to the survey questions in the relevant subject field within the results of our survey.

Diabetes and Cardiovascular System

Participants stated that they mostly preferred coronary artery calcium scoring with computed tomography (CT) (50.0%) for cardiovascular (CV) risk assessment in asymptomatic patients with DM. In these patients, carotid ultrasonography (USG) and ankle brachial index (ABI) are preferred at a rate of 33.3%, and 13.73%, respectively. Interestingly, 33 (32.35%) cardiologists stated that they did not prefer any of the carotid USG, coronary artery calcium scoring with CT or ABI in the assessment of CV risk in asymptomatic patients with DM. In asymptomatic patients with DM, 62 (60.78%) participants considered CT coronary angiography or functional imaging in CAD screening, 7.84% of the participants were not sure. Sixty-three (60%) participants thought there was enough evidence to recommend a Mediterranean diet rich in poly- and mono-unsaturated fats to reduce CV events in pre-diabetic patients. 59.80% of the participants held the opinion that there is sufficient evidence for the hemoglobin A1c (HbA1c) < 7% to prevent macrovascular complications in diabetic patients. In addition, 72.55% of the participants held that systolic blood pressure target should be < 130 mmHg in this group. Sixty-one (65.69%) participants gave the answer yes to the question about low-dose aspirin prescription rate for primary prevention in high-risk patients with DM. Interestingly, 55 (53.92%) cardiologists did not agree with the recommendation classifying beta-blockers in class IIB in the ESC 2020 diabetes guideline for patients with DM and CAD. When we identified three-vessel disease with a SYNTAX score of 15 in the diabetic patient with CCS, 53.92% of the cardiologists considered percutaneous

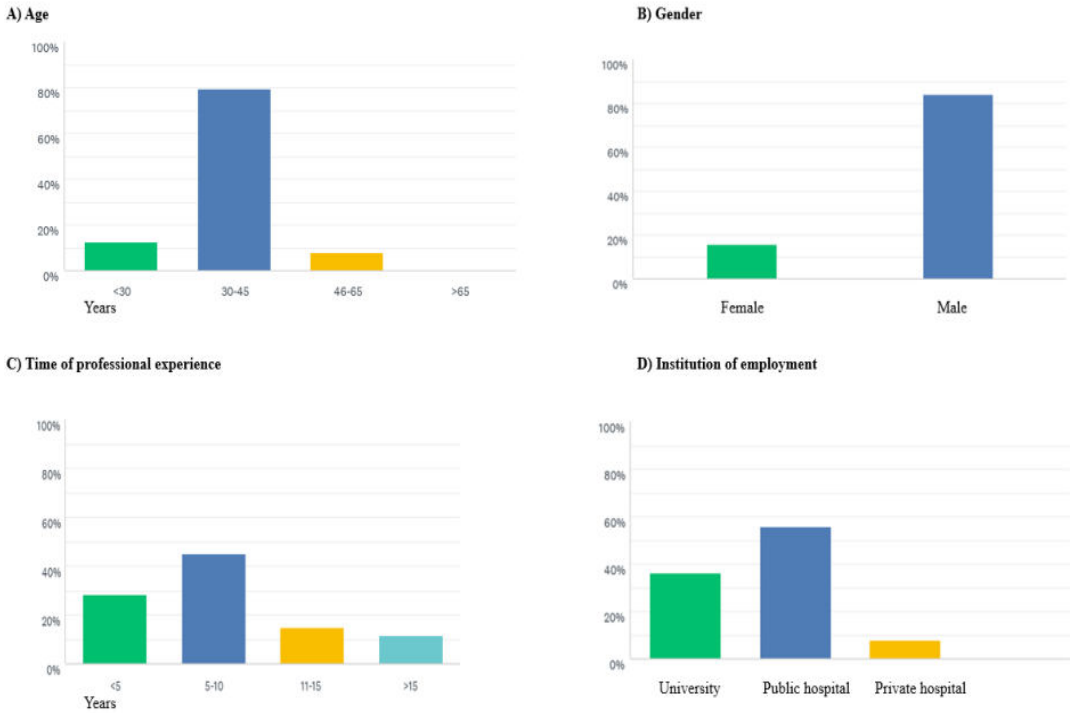

Fig. 1. Demographic data of participants.

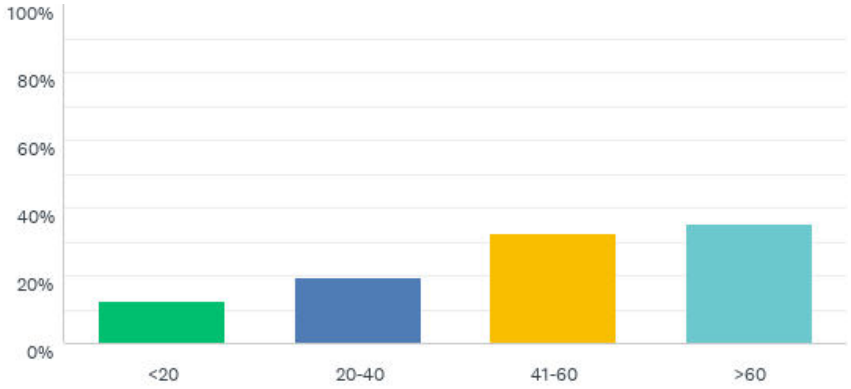

Fig. 2. The number of out-patients dealt with by the participants daily.

coronary intervention (PCI) and 43.14% did not consider PCI despite low surgical risk (Table 1).

Cardiovascular Prevention and Diagnosis

The participants stated that they frequently preferred the treadmill exercise test (38.24%) to determine CAD in asymptomatic patients aged over 50 years, with HT and hyperlipidemia. Interestingly, the total consideration for myocardial perfusion scintigraphy (MPS) alone, and treadmill exercise test in men, and MPS in women (23.53%) was lower than the consideration for coronary CT angiography alone (25.49%). Importantly, the addition of a long-term second antithrombotic drug to aspirin for secondary prevention was not predominantly considered (79.41%) in patients with DM and CAD at high risk of bleeding.

Coronary Artery Disease

In patients who did not have major bleeding complications after acute coronary syndrome (ACS) and who tolerated dual antiplatelet treatment (DAPT), the proportion of participants who recommended DAPT for a period longer than a year was 49 (48.04%), and who did not was 43 (42.16%). It is interesting to note that no participant considered triple antithrombotic therapy more than 6 months in patients with atrial fibrillation (AF) at high risk of stent thrombosis, whereas the proportion of participants who said they would not consider it at all was 2.94%.

To a survey question involving a patient with CCS and angina with accompanying hypertension and hyperlipidemia, who presented a ST segment depression of 1.5 mm in inferior leads in treadmill exercise testing and 55% ejection fraction (EF) in echocardiography, 71.57% of the participants considered revascularization following coronary angiography, and 28.43% considered medical treatment alone. When we asked the participants whether patients undergoing PCI for ACS or elective PCI should be routinely subject to high-dose statin loading before the procedure, 55 (53.92%) participants agreed, 17 (16.67%) participants were not sure.

In patients with non-ST-elevation myocardial infarction (NSTEMI), the majority of the participants (91.18%) considered glycoprotein IIb/IIIa (GPIIb / IIIa) antagonists in no-reflow condition during PCI. In patients who underwent stent implantation after NSTEMI, also at high risk of bleeding, 53 (51.96%) participants stated that they continued P2Y12 receptor inhibitors for 6 months, 30 (29.41%) for 3 months and 17 (16.67%) for 1 month. Most of the participants (68.63%) stated that they did not consider complete revascularization in the same session in patients with NSTEMI-ACS with multi-vessel CAD and without cardiogenic shock. Ninety-nine (97.06%) participants stated that a short-term mechanical support device or inotropic agents can be used in cardiogenic shock after ST-elevation myocardial infarction (STEMI) if possible. Ninety-four (92.16%) participants stated that in patients with chronic renal failure, they applied hydration with isotonic saline before and after the procedure if the expected contrast volume in invasive strategies was > 100 mL (Table 2).

Dyslipidemia

The lowest low density lipoprotein (LDL) value reached in practice with treatment by the cardiologists participating in the study was 40-70 mg/dl for 56 (54.90%) participants and < 40 mg/dl for 32 (31.37%) participants. One of the striking results of the survey

Table 1. Diabetes and cardiovascular system

Question	Answers	n (%)
Which of the following risk modifier would you consider for cardiovascular assessment in asymptomatic patients with DM?	Carotid USG	34 (33.3)
	Coronary artery calcium score by CT	51 (50%)
	ABI	14 (13.73)
	No idea	2 (1.96)
	None	33 (32.35)
Would you consider CT coronary angiography or functional imaging (radionuclide myocardial perfusion imaging, stress cardiac MRI, or exercise / pharmacological stress echocardiography) screening for CAD asymptomatic patients with DM?	Yes	62 (60.78)
	No	32 (31.37)
	Not sure	8 (7.84)
	No idea	0 (0)
Do you think we have enough evidence to recommend a Mediterranean diet, rich in polyunsaturated and monounsaturated fats, for pre-diabetic patients to reduce CV events?	Yes	63 (61.76)
	No	19 (18.63)
	Not sure	17 (16.67)
	No idea	3 (2.94)
Do you think opinions and evidence are sufficient for the target of HbA1C < 7% in diabetic patients to avoid macrovascular complications?	Yes	61 (59.80)
	No	25 (24.51)
	Not sure	15 (14.71)
	No idea	1 (0.98)
In which of the diabetic patient groups would you target SBP < 130 mmHg?	High risk group	74 (72.55)
	Very high risk group	21 (20.59)
	None	7 (6.86)
	No idea	0 (0)
Would you prescribe low-dose aspirin (75 - 100 mg / day) for primary prevention in diabetic patients with a very high CV risk (in the absence of significant contraindications)?	Yes	67 (65.69)
	No	32 (31.37)
	Not sure	3 (2.94)
	No idea	0 (0)
The ESC 2019 diabetes guideline recommends treatment with beta blockers as class IIb in patients with DM and CAD	Agree	44 (43.14)
	Disagree	55 (53.92)
	No idea	3 (2.94)
When you detect a three-vessel disease with a SYNTAX score of 15 in your diabetic patient with CCS, would you consider PCI despite the low surgical risk?	Yes	55 (53.92)
	No	44 (43.14)
	Not sure	3 (2.94)
	No idea	0 (0)
Would you consider the addition of a second long-term antithrombotic drug in addition to aspirin for secondary prevention in patients with DM and CAD without high risk of bleeding?	Yes	18 (17.65)
	No	81 (79.41)
	Not sure	3 (2.94)
	No idea	0 (0)
Would you consider DAPT for longer than 1 year in diabetic patients who do not have major bleeding complications after acute coronary syndrome and who tolerate DAPT?	Yes	49 (48.04)
	No	43 (42.16)
	Not sure	10 (9.80)
	No idea	0 (0)

The questions in this table were prepared based on 2019 Guidelines on Diabetes, Pre-Diabetes and Cardiovascular Diseases [4]. ABI = ankle brachial index, CAD = coronary artery disease, CCS = chronic coronary syndrome, CT = computed tomography, CV = cardiovascular, DM = diabetes mellitus, HbA1c = hemoglobin A1c, MRI = magnetic resonance imaging, PCI = percutaneous coronary intervention, SBP = systolic blood pressure, USG = ultrasonography

Table 2. Chronic coronary syndrome, ACS without persistent ST segment elevation and dyslipidemia

Question	Answers	n (%)
How long would you continue triple therapy with aspirin, clopidogrel and an OAC after PCI in your patients who had AF and high risk of stent thrombosis?	1-2 week	11 (10.78)
	4 week	44 (43.14)
	3 months	15 (14.71)
	3-6 months	29 (28.43)
	> 6 months	0 (0)
	Ever	3 (2.94)
What would be your primary anti-anginal treatment considered in 58-year-old male patient with CCS? In addition he had HT, Hyperlipidemia, 1.5 mm ST depression in DII, DIII and aVF derivations in the treadmill exercise test and 55% EF in echo, and had no previous ACS?	Drug therapy	29 (28.43)
	Revascularization following coronary angiography	73 (71.57)
Which of the following tests would you usually consider for the detection of coronary artery disease in asymptomatic patients over 50 years of age with HT and Hyperlipidemia?	Myocardial perfusion scintigraphy	10 (9.80)
	Treadmill effort test	39 (38.24)
	CT angiography	26 (25.49)
	Treadmill exercise test in men, myocardial perfusion scintigraphy in women	14 (13.73)
	None	13 (12.75)
Should routine high-dose statin loading be performed before the procedure in patients undergoing PCI for ACS or elective PCI?	Yes	55 (53.92)
	No	29 (28.43)
	Not sure	17 (16.67)
	No idea	1 (0.98)
Do you prefer GP IIb / IIIa antagonists in case of no-reflow during percutaneous coronary intervention in NSTEMI patients?	Yes	93 (91.18)
	No	4 (3.92)
	Not sure	3 (2.94)
	No idea	2 (1.96)
When do you consider discontinuing P2Y12 receptor inhibitör treatment in patients with high risk of bleeding undergoing stent implantation after NSTEMI?	1 month	17 (16.67)
	3 months	30 (29.41)
	6 months	53 (51.96)
	No idea	2 (1.96)
Do you perform complete revascularization in the same session in NSTEMI-ACS patients with multi-vessel CAD without cardiogenic shock?	Yes	26 (25.49)
	No	70 (68.63)
	Not sure	4 (3.92)
	No idea	2 (1.96)
If the expected contrast volume in myocardial revascularization is > 100 mL in patients with chronic kidney failure, do you hydrate before and after the procedure with isotonic saline?	Yes	94 (92.16)
	No	6 (5.88)
	No idea	2 (1.96)
What is the lowest LDL range value you have reached with treatment in practice?	> 100	2 (1.96)
	70-100	12 (11.76)
	40-70	56 (54.90)
	< 40	32 (31.37)

Table 2 contunied. Chronic coronary syndrome, ACS without persistent ST segment elevation and dyslipidemia

Question	Answers	n (%)
Do you also consider Lp(a) values in the treatment plan of your patients with dyslipidemia?	Yes	7 (6.86)
	No	35 (34.31)
	Sometimes	7 (6.86)
	There is no possibility to measure Lp(a) level in my center	53 (51.96)
Would you consider statin + fenofibrate treatment for primary prevention or high-risk patients if the LDL-C target is achieved and TG levels are > 200 mg/dL?	Very rare	28 (27.45)
	Rare	47 (46.08)
	Sometimes	22 (21.57)
	Often	2 (1.96)
	Ever	3 (2.94)
How often do you prescribe the Ezetimib + Statine combination?	Very rare	43 (42.16)
	Rare	37 (36.27)
	Sometimes	16 (15.69)
	Often	4 (3.92)
	Ever	2 (1.96)

The questions in this table were prepared based on 2020 ESC Guidelines for the management of acute coronary syndromes, 2019 ESC/EAS Guidelines for the management of dyslipidaemias, 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes [3, 6, 10]. ACS = acute coronary syndrome, AF = atrial fibrillation, CCS = chronic coronary syndrome, CT = computed tomography, DAPT = dual antiplatelet treatment, EF = ejection fraction, GP Iib/IIIa = glycoprotein Iib/IIIa, HT = hypertension, LDL = low density lipoprotein, Lp(a) = lipoprotein a, NSTEMI = non-ST-elevation myocardial infarction, PCI = percutaneous coronary intervention, STEMI = ST-elevation myocardial infarction

was the answer given to the question whether Lp(a) levels were taken into account in order to guide the treatment in patients with dyslipidemia. Fifty-three (51.96%) participants stated that they did not have the capability to measure the Lp(a) level at their center, and 34.31% said they did not consider it. Fenofibrate + statin combination (very rare: 27.45%, rare 46.06%) and ezetimibe + statin combination (very rare: 42.16%, rarely 36.27%) were rarely considered in the treatment of dyslipidemia (see Table 2).

Arrhythmia

One of the important points is that the majority of the participants (77.45%) said they would not recommend an oral anticoagulant to a 60-year-old male patient with AF and a CHA2DS2-VASc score < 1. Forty-five (44.12%) participants said they frequently used the HAS-BLED score in clinical practice to evaluate the bleeding risk of patients with AF, whereas 35 (34.31%) said they used it sometimes and 5 (4.9%) said they never used it. 48 (47.06%) cardiologists said they frequently used amiodarone or propafenone before elective electrical cardioversion in atrial fibrillation, 24 (23.53%) said they used it sometimes and 10 (9.80%) said they never used it.

Ninety-one (%89.22) of cardiologists said they considered closure of the appendix in patients with AF who are at higher risk of stroke and in whom long-term oral anticoagulants are contraindicated. The proportion of considering catheter ablation treatment to asymptomatic Wolff-Parkinson-White (WPW) patients was 58.82%, whereas the proportion of those who had no idea was 5.88%. In stable acute wide QRS tachycardia, 67.65% of the participants considered amiodarone. 83 participants (82.18%) considered catheter ablation in athletes with paroxysmal supraventricular tachycardia (PSVT) without pre-excitation (Table-3).

Valvular Heart Disease and Adult Congenital Heart Disease

In the treatment planning of patients with asymptomatic severe aortic stenosis, 36.27% of the participants recommended exercise test, and 36.27% of the participants did not. One of the striking results of the questionnaire was that 84 (83.17%) cardiologists said

Table 3. Adult congenital heart disease, atrial fibrillation and sports cardiology

Question	Answers	n (%)
Would you consider the use of oral anticoagulation in a 60-year-old male patient with AF and a CHA2DS2-VASc score <1?	Yes	18 (17.65)
	No	79 (77.45)
	Not sure	5 (4.90)
	No idea	0 (0)
Do you use the HAS-BLED risk score to evaluate the bleeding risk of patients with atrial fibrillation in your clinical practice?	Very rare	8 (7.84)
	Rare	9 (8.82)
	Sometimes	35 (34.31)
	Often	45 (44.12)
	Ever	5 (4.90)
Do you use amiodarone or propafenone beforehand to facilitate the success of elective electrical cardioversion in your patients with AF?	Very rare	7 (6.86)
	Rare	13 (12.75)
	Sometimes	24 (23.53)
	Often	48 (47.06)
	Ever	10 (9.80)
Appendix closure in patients with AF who have a high risk of stroke and in whom long-term oral anticoagulants are contraindicated	Recommend	91 (89.22)
	Do not recommend	7 (6.86)
	No idea	4 (3.92)
In patients with suspected paradoxical embolism (after excluding other causes), ASD should be closed regardless of size in the absence of PAH and left ventricular disease	I definitely think	46 (45.10)
	I think	44 (43.14)
	I don't think	10 (9.80)
	I definitely don't think	0 (0)
	No idea	2 (1.96)
Would you consider catheter ablation therapy to your asymptomatic WPW patient?	Yes	60 (58.52)
	No	36 (35.29)
	No idea	6 (5.88)
Is Amiodarone your first choice in stable acute wide QRS tachycardia?	Yes	69 (67.65)
	No	32 (31.37)
	No idea	1 (0.98)
Would you consider catheter ablation in competitive athletes who have paroxysmal supraventricular tachycardia (PSVT) without pre-excitation?	Yes	83 (82.18)
	No	18 (17.82)
	No idea	0 (0)
Would you consider an exercise treadmil test to plan treatment for your patient with asymptomatic severe aortic stenosis?	Yes	37 (36.27)
	No	37 (36.27)
	Sometimes	28 (27.45)
	No idea	0 (0)
Would you consider that additional aortic valve replacement to the patients with moderate aortic stenosis who are scheduled for CABG?	Yes	84 (83.17%)
	No	9 (8.91%)
	I leave the decision to the heart surgeon	8 (7.92%)
Bromocriptine treatment in peripartum cardiomyopathy	Use in all cases	14 (13.73)
	Use if there is no cardiogenic shock	14 (13.73)
	Use in cases with high prolactin levels	31 (30.39)
	Use if there is RV failure and / or cardiogenic shock	23 (22.55)
	Never use	20 (19.61)

The questions in this table were prepared based on 2020 ESC Guidelines for the management of Adult Congenital Heart Disease, 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation,2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease, 2019 ESC Guidelines for the management of patients with supraventricular tachycardia [5, 7-9]. AF = atrial fibrillation, ASD = atrial septal defect, CABG = coronary artery bypass graft, RV = right ventricul, PAH = pulmonary arterial hypertension, PSVT = paroxysmal supraventricular tachycardia, WPW = Wolff-Parkinson-White

that aortic valve replacement should be performed during the procedure in patients with moderate aortic stenosis who were scheduled for coronary artery bypass graft (CABG), and 9 (8.91%) said it should not be performed. The number of cardiologists who said he or she would leave the decision to the heart surgeon was 8 (7.92%) (see Table-3).

The proportion of those who definitely recommend atrial septal defect (ASD) closure regardless of its size in patients with suspected paradoxical embolism (who do not have pulmonary arterial hypertension (PAH) and left ventricular disease) was 45.10%.

Heart Failure

We asked the participants about the conditions in which they would prefer bromocriptine treatment in peripartum cardiomyopathy, a recent topic of discussion, 13.37% of the participants stated that they would use it in all cases and 19.61% said they did not use it at all. Fourteen (13.37%) participants said they would use it if there was no cardiogenic shock, 30.39% said they would use it in cases with high prolactin level, and 22.55% said they would use it in the absence of right ventricular failure and cardiogenic shock (Table3).

DISCUSSION

In this survey study, we aimed to assess the perspective of cardiologists on ESC class-II recommendations and to raise awareness.

In the assessment of cardiovascular risk in asymptomatic patients with diabetes mellitus, 33 (32.35%) cardiologists stated that they did not prefer either carotid USG, coronary calcium scoring with CT, or ABI, a finding suggesting that there is a difference of opinion regarding the class II recommendations. We think that cost, difficulties in accessing diagnostic tests, and patient-related reasons may be effective in this situation.

In addition, the fact that the participants stated they mostly preferred coronary artery calcium scoring by CT (50.0%), and to a large extent (60.78%), recommended CT coronary angiography or functional imaging for CAD screening shows that a significant number of participants favor selective or nonselective coronary artery imaging. We estimate that the availability of coronary angiography units in many centers was effective in forming such a consensus.

Although beta blockers were classified in class IIB recommendation in patients with DM and CAD in the ESC 2020 diabetes guidelines, 55 (53.92%) cardiologists did not agree with this recommendation. We think that the reason for the high rate of disagreement with this recommendation is that beta blockers may cause glucose irregularity and do not have a sufficient effect on survival in symptomatic patients.

The predominance of those who did not recommend the addition of a second long-term antithrombotic drug to aspirin for secondary protection (79.41%) in patients with DM and CAD without high risk of bleeding suggests that the concerns over the risk of bleeding still outweigh administration of DAPT. However, according to EUROASPIRE IV Turkey data, antiplatelet drugs, beta blockers, ACEI/ARB and statins were used more frequently than EUROASPIRE III Turkey data. This may suggest that patients' awareness has increased and they have started to use their medications more regularly. EUROASPIRE-IV Turkey data revealed that second-ary prevention was unsatisfactory and had progressed unfavorably compared with last EUROASPIRE study, some risk factors were more uncontrolled than overall European average, and coronary artery events at young age remain an important problem [11]. In this respect, it may be necessary to apply additional diagnostic tests to patients with risk factors.

In patients with CCS, angina and accompanying comorbid diseases, with ischemia findings on treadmill exercise testing and echocardiography, 71.57% of the cardiologists said they could consider revascularization with coronary angiography for anti-anginal treatment. We think that the reason behind this opinion is the relative ease of access to coronary angiography units, low complication rates, the perceived difficulty in the application and follow-up of maximal medical treatment. The TURKMI registry demonstrated that PCI was performed in Turkey with a low risk of complication in acute MI. This study also showed that the risk of in-hospital mortality decreased by 50% during 20 years probably due to an increased number of PCI

and high level of guideline implementation [12].

A significant percentage of the participants stated that they could not measure Lp(a) levels in terms of guiding the treatment in dyslipidemia patients, and some of them stated that they did not take it into account. Most likely, the fact that parameters such as LDL, HDL and triglycerides are more easily accessible in many health centers contributed to this result. In addition, more frequent studies have been reported on parameters such as LDL, HDL and triglycerides rather than Lp(a) level in the planning of hyperlipidemia treatment and follow-up.

The fact that the majority of the participants (77.45%) would not give oral anticoagulants to patients AF and a CHA2DS2-VASc score < 1 indicates that the worries about bleeding prevail. According to GARFIELD-AF TURKEY data; AF patients in Turkey were mostly seen in young women. However, despite being younger, patients had a significant burden of comorbidity. Stroke risk by CHADS2 score and CHA2DS2-VASc score compared with world data. The average of the risk score values, including the HAS-BLED score, was lower in Turkey than in the world data. FXa inhibitors alone or in combination with antiplatelets have been prescribed more frequently in low- and high-risk patients in Turkey. New oral anticoagulant (NOAC) therapy was replaced with antiplatelets when the bleeding risk was higher. All-cause mortality was higher in Turkey [13]. In addition RAMSES study showed that the awareness of stroke preventions strategies for NVAF has increased in Turkey and that more than two-thirds of NVAF patients were on OAC therapy. However, the proportion of antiplatelet use was still high among NVAF patients. The findings also showed that NOACs are preferred over VKAs for anticoagulation in a representative clinical population of NVAF patients [14]. The recommendation of catheter ablation in athletes with paroxysmal supraventricular tachycardia without pre-excitation by 83 (82.18%) participants may be associated with the belief that chances of success are high in interventional procedures.

There was consensus among the participants given that 83.17% of the participants said aortic valve replacement should be performed during the procedure in patients who were scheduled for CABG and who had moderate aortic stenosis.

We concluded that there was no clear consensus among participants on the conditions in which they would prefer bromocriptine treatment in peripartum cardiomyopathy, a recent topic of discussion. We think that meta-analyses and larger studies are needed on this subject.

Limitations

In this survey study, class-II recommendations were not evaluated separately as IIa and IIb. Equal distribution was not made from the seven geographical regions of Turkey. Also, the sample size was relatively small. It is inevitable that the cardiologists participating in the survey affected the answers given due to the different service quality of the study centers.

CONCLUSION

Health services in Turkey can contribute to the implementation of some ESC class-II recommendations by increasing access to services in diagnosis and treatment. In online or live training meetings; awareness can be created by literature studies, experience sharing and national multicenter studies on ESC class-II recommendations. At the same time, Turkey's data on this subject can be obtained and contributed to real-life results.

Authors' Contribution

Study Conception: MK, BE; Study Design: MZ, MK; Supervision: BE, TG; Funding: MK, TG; Materials: MK, TG; Data Collection and/or Processing: MK, TG; Statistical Analysis and/or Data Interpretation: TG, MK; Literature Review: MK, BE, TG; Manuscript Preparation: KÇ and Critical Review: MZ, TG.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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Table Appendix: Supplementary data

Questions	Options
What is your age range?	< 30 30-45 46-65 > 65
Your Gender?	Female Male
How long have you been working as a cardiologist?	< 5 year 5-10 year 11-15 year > 15 year
What is your practice setting?	University Public Hospital Private Hospital Private Practice
Number of patients you care for per day in the outpatient clinics?	< 20 20-40 41-60 > 60
Which of the following methods would you consider for cardiovascular risk assessment in asymptomatic DM patients? (you can choose more than one option)	Carotid USG Coronary artery calcium score by CT ABI (ankle brachial index) I have no idea. None.
Would you consider CT coronary angiography or functional imaging (radionuclide myocardial perfusion imaging, stress cardiac MRI, or exercise / pharmacological stress echocardiography) for asymptomatic DM patients?	Yes No I am indecisive. I have no idea.
Do you think we have enough evidence to recommend a Mediterranean diet rich in polyunsaturated and monounsaturated fats for pre-diabetic patients to reduce cardiovascular events?	Yes No I am indecisive. I have no idea.
Do you think opinions and evidence are sufficient enough for the HbA1C <7% target to prevent macrovascular complications in diabetic patients?	Yes No I am indecisive. I have no idea.
For which of the following diabetic patient groups would you target SBP <130 mmHg?	High risk group Very high risk group None. I have no idea.
Would you prescribe low dose aspirin (75 - 100 mg / day) for primary prevention in diabetic patients with very high CV risk (in cases where there are no obvious contraindications)?	Yes No I am indecisive. I have no idea.
The ESC 2019 diabetes guideline recommends beta-blockers class IIb for DM and CAD patients.	I agree. I do not agree. I have no idea.
If you detect a three-vessel disease with a SYNTAX score of 15 in your diabetic chronic coronary artery patient, would you recommend PCI despite the low surgical risk?	Yes No I am indecisive. I have no idea.

Table Appendix Continued: Supplementary data

Questions	Options
Which of the following tests do you usually prefer for the detection of coronary artery disease in patients over 50 with asymptomatic, HT and Hyperlipidemia?	Myocardial perfusion scintigraphy Treadmill Effort Test CT angiography Treadmill Effort Test in men, myocardial perfusion scintigraphy in women None.
Would you consider the addition of a second long-term antithrombotic medication in addition to aspirin for secondary prevention in DM and CAD patients who are not at high risk of bleeding?	Yes No I am indecisive. I have no idea.
Would you consider dual antiplatelet therapy for longer than 1 year in diabetic patients who do not have major bleeding complications after acute coronary syndrome and who tolerate DAPT?	Yes No I am indecisive. I have no idea.
Would you consider the use of oral anticoagulation in a patient with AF, Male, 60 years old, with CHA2DS2-VASc score < 1?	Yes No I am indecisive. I have no idea.
What is the lowest LDL range value you have achieved with treatment in your practice?	> 100 mg/dL 70-100 mg/dL 40-70 mg/dL < 40 mg/dL
For how long would you consider triple antiplatelet therapy after PCI in your patients with AF for whom you think the risk of stent thrombosis is high?	1-2 weeks 4 weeks 3 months 3 to 6 months Never
Do you also consider the lipoprotein (Lp(a)) values in the treatment plan of your dyslipidemia patients?	Yes No Sometimes It is not possible to measure Lp(a) level in the center where I carry out my practices.
How often do you prescribe the Fenofibrate + Statin combination?	Very rarely Rarely Sometimes Often Never

Table Appendix Continued: Supplementary data

Questions	Options
What would be your primary anti-anginal treatment preference in your chronic coronary syndrome patient, who is 58 years old, male, suffering from angina, with HT, Hyperlipidemia, 1.5 mm ST depression in DII, DIII and aVF derivations in exercise treadmill test and with an EF of 55% in echo?	Medical treatment Revascularization following coronary angiography
How often do you prescribe the Ezetimibe + Statin combination?	Very rarely Rarely Sometimes Often Never
Should routine loading with high-dose statin be performed before the procedure in patients undergoing PCI with ACS or elective PCI plan?	Yes No I am indecisive. I have no idea.
Would you consider catheter ablation therapy to your asymptomatic WPW patient?	Yes No I have no idea.
Is Amiodarone your first choice in stable acute wide QRS tachycardia?	Yes No I have no idea.
Would you consider Appendix Closure in AF patients with high risk of stroke and contraindicated use of long-term oral anticoagulants?	I would recommend. I would not recommend. I have no idea.
Would you use short-term mechanical assist devices or inotropic agents if possible in cardiogenic shock after STEMI?	I would use. I would not use. I have no idea.
Do you use Bromocriptine treatment in peripartum cardiomyopathy?	I use it in all cases. I use it if there is no cardiogenic shock. I use it in cases with high prolactin levels. I use it if there is RV failure and/or cardiogenic shock. I never use it.
Do you use the HAS-BLED risk score to evaluate the bleeding risk of atrial fibrillation patients in your clinical practice?	Very rarely Rarely Sometimes Never Often
Do you use amiodarone or propafenone in advance to facilitate the success of elective electrical cardioversion in your AF patients?	Very rarely Rarely Sometimes Never Often

Table Appendix Continued: Supplementary data

Questions	Options
Do you consider using GP IIb/IIIa antagonists in case of no-reflow during percutaneous coronary intervention in NSTEMI patients?	Yes No I am indecisive. I have no idea.
How long do you continue P2Y12 receptor inhibitor therapy in patients with high risk of bleeding who underwent stent implantation after NSTEMI?	1 month 3 months 6 months I have no idea.
Do you consider full revascularization in the same session in NSTEMI-ACS patients with multivessel CAD without cardiogenic shock?	Yes No I am indecisive. I have no idea.
Do you hydrate with isotonic saline before and after treatment if the expected contrast volume in invasive strategies in patients with chronic renal failure is> 100 mL?	Yes No I have no idea.
Would you consider catheter ablation for athletes with paroxysmal supraventricular tachycardia (PSVT) without pre-excision?	Yes No I have no idea.
Would you consider ASD closure regardless of size in patients with suspected paradoxical embolism (after excluding other causes) unless they have PAH and left ventricular disease?	I would definitely consider. I would consider. I would not consider. I would definitely not consider. I have no idea.
Would you consider an exercise test to plan the treatment of your patient with asymptomatic severe aortic stenosis?	Yes No Sometimes I have no idea.
Do you think aortic valve replacement should be performed in patients with moderate aortic stenosis in addition to the planned CABG?	Yes No I leave the decision to the heart surgeon.
Do you consent to the use of the answers you provided within the scope of the current survey in scientific processes (provided that your information remains anonymous)?	I consent. I do not consent.

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