

Self-reported hypertension, dyslipidemia and hyperuricemia management by Italian Internal Medicine Units: a national survey of the FADOI Study Group in Cardiovascular Medicine

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See online Appendix for Questionnaire.

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ABSTRACT

The aim of this study was to evaluate the management practices of internal medicine clinicians for patients with cardiovascular risk factors, with particular respect to treatment thresholds, medication choices and target goals. A sample of internists - representatives of Internal Medicine Units (IMUs) from all the regions in Italy - were identified by the cardiovascular medicine study group of the Italian Internal Medicine FADOI (*Federazione delle Associazioni dei Dirigenti Ospedalieri Internisti*) Society and invited to fill out a questionnaire about hypertension, dyslipidemia and hyperuricemia. From the 101 questionnaires collected, it was found that despite large heterogeneity between IMUs in terms of patient management and adherence to guidelines, internists were experts in the management of patients with multiple cardiovascular risk factors and associated comorbidities. We hope that these data prompt the internal medicine community to consider the value of producing shared, real-world guidelines on the management of cardiovascular disease.

Introduction

A modern approach to arterial hypertension management does not merely aim to lower blood pressure (BP) values. European hypertension guidelines recommend assessing overall cardiovascular (CV) risk, as multiple CV risk factors frequently coexist in the same hypertensive subject.¹ In particular, both dyslipidemia and hyperuricemia are often additional CV risk factors in the hypertensive (HT) subject and, in addition to lowering BP values, specific treatment of these conditions is required to reduce the overall CV risk.^{2,3}

Patients admitted to Internal Medicine Units (IMUs) are elderly with multiple co-morbidities³ and consequently internists have to manage patients with complex pathological profiles. In order to obtain the right diagnosis and prescribe proper treatment, a multidisciplinary approach is mandatory.⁴

Current hypertension guidelines aim to improve the quality of patient care by providing specific recommendations for daily medical practice,¹ but despite considerable efforts in developing and implementing these evidence-based guidelines, adherence to recommendations is often suboptimal.⁵

In clinical practice, many factors may influence the implementation of guidelines, and barriers to the adherence of recommendations can be related to the patient, who may have clinical features different to those of patients in randomized controlled trials, as well as to the physician and health-care system.⁶ Gaining knowledge about these barriers, which prevent healthcare providers from using guidelines, is an important initial step towards the improvement of quality of care in clinical practice.^{7,8}

The aim of this study was to investigate the management practices of Italian internal medicine clinicians of patients with arterial hypertension, dyslipidemia and hyperuricemia, with a particular focus on treatment thresholds, medication choices and target goals.

Materials and Methods

The questionnaire was filled in between March and May 2016 by 101 IMUs. Participation in the sur-

vey was voluntary and completely anonymous. Italy was divided into three main areas: namely the northern, central and southern regions (the latter including the two main islands). As shown in Figure 1, the northern area included the Friuli-Venezia Giulia, Liguria, Lombardy, Piedmont, Trentino-Alto Adige, Veneto and Aosta Valley regions; the central area included the Abruzzo, Emilia-Romagna, Lazio, Marche, Molise, Tuscany and Umbria regions; the southern area included the Basilicata, Calabria, Campania, Apulia, Sardinia and Sicily regions. In each of the three main regions, a coordinator identified by the national executive board of the Italian Internal Medicine FADOI (*Federazione delle Associazioni dei Dirigenti Ospedalieri Internisti*) Society was responsible for data collection together with regional coordinators, appointed by regional councils.

General protocol

The study group in cardiovascular medicine of FADOI first identified all IMUs where there was a hypertension center or a clinic dealing with cardiovascular medicine and then asked the physicians working in these IMUs to fill out a questionnaire concerning the management of hypertension, dyslipidemia and hyperuricemia with relation to the recommendations proposed in the main guidelines (Appendix).

Statistical analysis

Continuous variables were averaged, expressed as mean \pm standard deviation, and compared using analysis of variance. Comparison between categorical variables was performed using the Chi Square test. Data were analyzed using the SPSS statistical package for Windows, version 19 (SPSS, Chicago, IL, USA). The chosen degree of significance was the conventional value of $P < 0.05$.

Results

The general characteristics of the services provided by Italian IMUs are shown in Table 1. Most of the IMUs had managed patients at high cardiovascular

risk for at least 17 years and, on average, two doctors were involved in patient management. However, few of the IMUs (25%) were recognized by Italian scientific associations or boards, particularly in the central area. 24-hour ambulatory blood pressure monitoring (24-h ABPM) was available in 75.2% of the centers, while echocardiogram and carotid artery ultrasound were available in less than 60% of the IMUs. Although the average length of consultation was 15-30 min, waiting lists were rather long (over one month in 34.9% of IMUs).

BP assessment was quite heterogeneous between IMUs, and BP measurement in an orthostatic position was performed in patients during the first consultation in 69.8% of cases. Interestingly, the diagnosis of HT was extremely variable among the different centers: most IMUs confirmed HT diagnosis by calculating the average of 3 BP measurements and only 19% of these followed the guidelines recommendations. The 2013 European hypertension guidelines suggest taking at least two BP measurements; additional measurements are recommended if the first two are quite different. The guidelines suggest considering BP average, if

deemed appropriate. BP measurement was mostly performed using aneroid devices that were checked and calibrated yearly in 41.3% of centers (Table 2). Not all centers were able to diagnose secondary hypertension. Research activity was performed in few IMUs; only 23.8% of IMUs had collaborated with FADOI. On the other hand, two thirds of IMUs (68.3%) provided continuing medical education courses for general practitioners, particularly in the southern region.

Concerning dyslipidemia management, a *lipidology center* - defined as an outpatient clinic with internists dealing with dyslipidemia - was found in 46% of IMUs (Table 3), particularly in the northern area. In 41.3% of IMUs, between 300 and 1000 visits per year were performed, with an average time of consultation greater than 15 min in 75.1% of IMUs. Lipid profile was assessed in patients aged more than 40 years in 61.9% of centers, and only 36.5% of responders declared assessing lipid profiles in patients after a cardiovascular event. For the treatment of the mild hypercholesterolemia, most centers adopted diet modification as a first approach, whilst 22.2% considered statin use. In 15.9% of IMUs, nutraceutical compounds were considered effective for the treatment of hypercholesterolemia, particularly in the southern area. For the treatment of the hypertriglyceridemia, omega-3 was used by half of IMUs and fibrates by 31.7%, with a lower usage among IMUs of the central region. In contrast to the recommendations of the main guidelines, statin use for treatment of hypertriglyceridemia was observed in 22% of IMUs. The Dutch score, recommended by guidelines to diagnose familial hypercholesterolemia (FH), was used by a third (34.9%) of IMUs, and 36.5% of the latter were unaware of FH treatment with proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors.

In the management of hyperuricemia, different cut-off values for hyperuricemia diagnosis were found (Table 4). In approximately 10% of IMUs, the diagnosis of hyperuricemia was carried out using serum uric acid (SUA) levels greater than 8 mg/dL, particularly in IMUs from the northern region. Over two thirds (71.4%) of IMUs believed that treatment of asymptomatic hyperuricemia (AHU) was beneficial; with respect to this, allopurinol remained the most prescribed hypouricemic drug, followed by febuxostat, which was prescribed in 41.3% of IMUs. The SUA targets in patients treated for AHU varied among IMUs, with an SUA level <6 mg/dL the most preferred goal.



Figure 1. The main areas of the study group in cardiovascular medicine of the Federation of Associations of Hospital Doctors in Internal Medicine (FADOI) are shown.

Discussion

In this survey, IMUs were found to have almost twenty years' experience in the field of cardiovascular medicine, involving both medical doctors and nurses in patient management about 3 days per week.

Table 1. General characteristics of the main services provided by internal medicine units in Italy.

	All (n=101)	Northern area (n=48)	Central area (n=33)	Southern area (n=20)	P value
Years of activity	17.1±12.3	17.8±11.0	18.6±13.3	13.6±9.0	NS
Medical doctors employed	2.0±1.3	1.8±1.0	2.4±1.4	1.9±1.4	NS
Other persons involved	1.7±1.1	1.5±0.9	2.4±1.3	1.6±1.3	NS
Opening days of service	3.2±2.0	2.9±1.9	3.4±2.2	3.2±2.0	NS
Secondary HT management (%)	64.4	60.1	63.6	75.0	NS
Accreditation (yes, %)	24.8	25.0	15.1	40.0	0.027
Regional	4.0	-	3.0	15.0	0.027
National	20.8	25.0	12.1	25.0	0.027
Services provided (yes, %)					
EKG	80.2	75.0	75.8	100.0	0.046
Echocardiogram	52.5	43.8	48.5	80.0	0.021
24-h ABPM	75.2	79.2	72.7	70.0	NS
Carotid ultrasound	63.4	50.0	72.7	80.0	0.026
Renal ultrasound	36.3	29.2	51.5	30.0	NS
Ankle brachial index	42.6	35.4	42.4	60.0	NS
Tonography	5.0	6.3	-	10.0	NS
Electronic medical records (yes, %)	75.2	79.2	72.7	70.0	NS
Ways of booking (%)					
Single booking center	25.7	25.0	18.0	40.0	NS
Direct access	35.6	41.7	30.3	30.0	NS
GPs	12.9	16.7	9.1	10.0	NS
Specialist	21.8	14.6	42.4	5.6	NS
Others	4.0	2.1	-	15.0	NS
Admission to IMUs (%)					
Urgent	65.1	64.2	61.3	72.1	NS
Internal	34.9	57.1	25.9	33.3	NS
Nurse booking	9.5	-	12.9	11.1	NS
Others	17.5	7.1	25.8	11.1	NS
Research activity (yes, %)	29.7	29.2	30.3	30.0	NS
Research activity for FADOI (yes, %)	23.8	20.8	24.2	30.0	NS
Experimental studies (yes, %)	39.6	33.3	42.4	50.0	NS
CME for GPs (yes, %)	68.3	66.7	60.6	85.0	NS
Length of consultation at the 1 st clinical visit					
15 min	9.5	-	16.1	5.6	NS
15-30 min	74.6	57.1	77.4	83.3	NS
>30 min	14.3	28.6	22.2	16.7	NS
Waiting time for visit					
1 week	25.4	14.3	22.6	38.9	NS
15 days	33.3	35.7	35.5	27.8	NS
~1 month	34.9	35.7	35.5	33.3	NS
Interaction with GPs					
Yes	9.5	14.3	9.7	5.6	NS
No	63.5	78.8	61.3	55.6	NS
Sometimes	25.4	-	25.8	44.4	0.016
Visits per year					
<500	63.5	50.0	74.2	55.6	NS
500-1000	25.4	28.6	19.8	33.2	NS
>1000	4.8	7.1	3.2	5.6	NS
Control visits yearly (yes, %)					
1	20.6	35.7	22.6	5.6	NS
2	55.6	50.0	48.4	72.2	NS
3	12.7	7.1	9.7	22.2	NS
>3	10.0	-	14.2	11.1	NS
Counseling to HTs (yes, %)					
Medical doctors	11.1	14.3	9.7	11.1	NS
Nurse	60.3	57.1	64.5	55.6	NS
Paper support	11.1	7.1	12.9	11.2	NS
All above	30.2	14.3	29	44.4	NS
Others	3.2	7.1	-	5.6	NS

NS, not significant; HT, hypertension; EKG, electrocardiogram; ABPM, ambulatory blood pressure monitoring; GPs, general practitioners; IMUs, Internal Medicine Units; CME, continuing medical education; HTs, hypertensive subjects.

Table 2. Blood pressure, albuminuria and glycated hemoglobin assessment by Italian Internal Medicine Units.

	All (n=101)	Northern area (n=48)	Central area (n=33)	Southern area (n=20)	P value
BP assessment position					
Sitting	38.1	35.7	25.8	68.1	0.048
Sitting an orthostatic	82.5	42.9	95.3	94.4	0.001
>60 years old only	6.3	-	3.4	9.7	NS
Diabetes and dysautonomia	17.5	7.1	25.8	11.1	NS
All HTs at the 1 th consultation	69.8	78.6	61.3	77.8	NS
BP assessment in both arms					
Always	22.9	42.9	12.9	22.2	NS
Only the first time	61.9	35.7	74.2	61.1	0.047
Only in some conditions	14.3	7.1	16.1	16.7	NS
HT diagnosis					
3 measurements average	60.3	57.1	71.0	44.4	NS
2 measurements average	15.9	14.3	16.1	16.7	NS
GL recommendations	19	28.6	3.2	38.9	NS
BP values >140/90 mmHg	4.8	-	9.7	-	NS
Criteria HT therapy starting					
GL recommendations	71.4	71.4	67.7	77.8	NS
Case by case	28.6	21.4	32.3	27.7	NS
Specific work-up for HT					
Overall outpatient package	34.9	35.7	25.8	50.0	NS
Day service	31.7	35.7	25.8	39.9	NS
Day Hospital	30.2	26.6	25.8	38.9	NS
Others	19.0	28.6	19.4	11.1	NS
Global risk assessment					
Cardiac risk of <i>Progetto Cuore</i>	9.5	14.3	9.7	5.6	NS
Score risk	32.3	28.6	29.0	44.4	NS
ESC GL	31.8	42.9	29.0	24.3	NS
Others	8.4	9.5	12.6	7.6	NS
24 h-ABPM use					
Always	36.5	14.3	35.5	55.6	NS
To assess BP treatment	54.0	64.3	41.9	66.7	NS
With other CV risk factors	42.9	61.3	33.3	49.2	NS
In addition to HBPM	46.0	42.9	41.9	55.6	NS
Fixed-combinations starting					
At the beginning	41.3	21.4	48.4	44.4	NS
After monotherapy	55.6	71.4	51.6	50.0	NS
HT secondary screening					
10%	31.2	28.6	25.8	39.8	NS
20%	23.2	14.9	16.1	38.9	NS
30%	15.9	26.6	12.9	11.1	NS
<40 years	11.4	7.1	19.4	-	NS
All	11.7	-	18.1	5.6	NS
BP measurement device					
Mercury	17.5	14.3	22.6	11.1	NS
Semi-automatic	39.7	42.9	38.7	38.9	NS
Aneroid	52.4	57.7	38.7	77.6	0.05
Others	7.9	-	6.5	7.9	NS
Check/calibration BP devices					
6 months	20.6	7.1	22.6	27.8	NS
Yearly	41.3	57.1	35.5	38.9	NS
Never	11.1	-	9.7	22.2	NS
None	18.5	14.3	29.0	5.6	NS
Brachial cuff BP cleaning					
Each day	4.8	7.1	6.5	-	NS
Each week	25.4	24.6	29.0	16.7	NS
Each month	27.0	28.6	22.6	33.3	NS
Never	9.8	7.0	6.5	16.7	NS
Under-cuff use	2.4	1.1	2.3	3.6	NS
Microalbuminuria assessment					
Yes	88.9	78.6	87.1	100	NS
No	11.1	21.4	12.3	-	NS
Microalbuminuria re-assessment					
6 month	54.0	35.7	51.6	72.2	NS
Yearly	33.3	50.0	32.3	22.2	NS
Never	6.3	-	9.7	5.6	NS

To be continued on next page

Table 2. Continued from previous page.

	All (n=101)	Northern area (n=48)	Central area (n=33)	Southern area (n=20)	P value
HbA1c evaluation in obese HTs					
Yes	63.5	71.4	74.2	38.9	0.037
No	36.5	28.6	25.8	47.8	
HbA1c evaluation in diabetic HTs					
Yes	93.7	71.4	100	100	0.001
No	6.3	28.6	-	-	

BP, blood pressure; NS, not significant; HTs, hypertensive subjects; HT, hypertension; GL, guidelines; ESC, European Society of Cardiology; ABPM, ambulatory blood pressure monitoring; CV, cardiovascular; HbA1c, albuminuria and glycated hemoglobin; HBPM, home blood pressure monitoring.

Table 3. General characteristics of dyslipidemia management in Internal Medicine Units in different regions of Italy.

	All (n=101)	Northern area (n=48)	Central area (n=33)	Southern area (n=20)	P value
Dyslipidemia clinic (yes, %)	46.0	64.3	35.5	50.0	0.05
Useful	61.9	64.3	51.6	77.8	NS
Useless	19.0	7.1	29.0	11.1	NS
Useful, but lack of staff	19.1	28.6	19.4	10.8	NS
Average time of consultation					
15 min (%)	25.4	35.7	25.8	27.8	NS
15-30 min (%)	38.1	35.7	38.7	27.8	NS
>30 min (%)	36.5	28.6	35.5	44.4	NS
Yearly consultations (n.)					
0-300 (%)	23.8	21.4	29.0	16.7	NS
300-1000 (%)	41.3	14.3	48.4	50	NS
>1000 (%)	9.5	7.1	6.5	16.7	NS
Follow up visits per year (yes, n.)					
1	28.6	28.6	16.1	50	0.025
2	6.3	2.8	9.7	5.6	NS
3	1.2	-	1.4	0.9	NS
Lipid profile assessment (%)					
All patients aged >40 years old	61.9	71.4	58.1	61.1	NS
FH only	33.0	50.0	19.4	44.0	NS
After a CV event	36.5	50.0	29.0	38.9	NS
History of CHD only	66.7	78.6	67.7	55.6	NS
Lipid control after therapy (days)					
30	11.1	-	12.9	16.7	NS
60	22.2	21.4	22.6	22.2	NS
90	54.0	50.0	54.8	55.6	NS
Mild hyper-TC therapy as 1 st step (yes/no, %)					
Diet	90.5	85.7	93.5	88.9	NS
Statins	22.2	14.3	22.6	27.8	NS
Fibrates	1.6	-	3.2	-	NS
Ezetimibe	3.2	-	-	11.1	NS
Nutraceuticals	15.9	-	12.9	33.3	0.031
Mild hyper-TG therapy (yes, %)					
Omega-3	50.8	50.0	54.8	44.4	NS
Fibrates	31.7	50.0	12.9	50.0	0.007
Statins	6.3	14.3	3.2	5.6	NS
Fibrates + Omega-3	30.2	21.4	32.3	33.3	NS
FH diagnosis (yes, no/%)					
Inside IMUs	61.4	52.2	66.7	75.0	NS
Outside IMUs	38.6	47.8	33.3	25.0	NS
FH diagnosis (yes, no/%)					
Polygenic form exclusion	12.7	7.1	9.7	22.2	NS
Cards risk	41.3	57.1	38.7	33.3	NS
Calculator individual	11.1	7.1	12.9	11.2	NS
Dutch lipid score	34.9	35.7	22.6	56.6	NS
FH treatment (yes/%)					
PCSK9	50.8	42.9	35.5	83.3	0.004
Do not know	36.5	42.9	51.6	5.6	0.005

NS, not significant; FH, familial hypercholesterolemia; CV, cardiovascular; CHD, coronary heart disease; TC, total cholesterol; TG, triglycerides; IMUs, Internal Medicine Units; PCSK9, proprotein convertase subtilisin/kexin type 9.

Our data confirm the close cooperation that exists between the Italian Internal Medicine Nursing Society, ANIMO (*Associazione Nazionale Infermieri di Medicina Interna Ospedaliera*), and FADOI. It is well known that nurses⁹ play a crucial role in the counselling and management of inpatients. Not all IMUs were able to diagnose secondary forms of hypertension or carry out scientific research, which is in part explained by the fact that some IMUs were uncertified by national or regional scientific societies or boards.¹⁰ Communication with the center of cardiovascular medicine was generally direct, but in few cases it was done by contacting a single booking center. Medical consultations lasted on average from 15 to 30 min and were in part facilitated by data from electronic medical records. The waiting list for consultations was quite short, about 1 month. In almost 70% of IMUs, a yearly average of 500 hypertension consultations were carried out, and the patient was re-examined every 6 months approximately.

The main finding of our survey was the large heterogeneity in terms of patient management and adherence to guidelines.⁸ In particular, it was observed that BP measurement was performed using many different devices and in very different fashions. Although the mercury sphygmomanometer is widely known as the *gold standard* method for office BP measurement, a ban on the use of mercury devices has led to a diminishing of its role in office and hospital settings.¹¹ Today, mercury devices have largely been phased out in Italian hospitals, which has resulted in a proliferation of non-mercury BP measurement devices. In accordance with previous studies,^{12,13} our survey showed that aneroid devices were the most used in IMUs; these devices are considered accurate and recommended for BP measurement in the main guidelines.¹⁴

However, these devices need frequent calibration and should be regularly checked to ensure that calibration remains within the European standard specification of ± 3 mmHg.¹⁵ Nevertheless, we found that most IMUs only checked these devices yearly; this frequency of calibration, which is fundamental for ensuring that BP is measured accurately, is unacceptable. Although BP cuffs are commonly shared in medical facilities, their routine disinfection was performed infrequently,¹⁶ facilitating bacterial infection.¹⁷ In 10% of IMUs, BP cuffs were cleaned once a month or less or even never. In addition, hospital staff reused BP cuffs without cleaning between patients; these data should be considered to evaluate preventive measures in reducing exogenous contamination of cuffs and skin infections. Fewer than 20% of centers confirmed the diagnosis of HT according to international guideline recommendations, and the assessment of global CV risk was carried out in different ways. IMUs in the southern region adhered to BP guidelines more than the other regions. One of the main issues seems to be the wrong perception of overall cardiovascular risk, which leads to inappropriate recommendations and treatment decisions.⁴ Our study was consistent with other findings where risk assessment was suboptimal:^{2,4} less than 35% of IMUs evaluated overall cardiovascular risk using scores recommended in the main guidelines.

Another aim of our survey was to evaluate the professional needs of internists in the management of patients with dyslipidemia. Hypertension and hypercholesterolemia are recognized as the main independent risk factors for CV diseases and they are often detected in the same subject.¹⁸ Their interaction causes a negative prognostic impact in terms of organ damage and clinical outcomes.¹⁹ Therefore, their management is mandatory for the reduction of global CV

Table 4. General characteristics of hyperuricemia management in internal medicine units based in different areas of Italy.

	All (n=101)	Northern area (n=48)	Central area (n=33)	Southern area (n=20)	P value
Cut-off for hyperuricemia diagnosis (yes/no)					
>7 mg/dL in both gender	39.7	14.3	48.4	44.4	NS
>8 mg/dL in both gender	9.5	37.5	9.2	10.0	0.001
2.4-5.7 in W and 3.4-7 in M	41.3	35.7	38.7	50.0	NS
AHU treatment					
Effective	75.4	70.0	74.2	83.3	NS
Not effective	13.3	15.7	16.1	11.1	NS
Possible	11.3	14.3	9.7	5.6	NS
Hypouricemic drugs (yes, no)					
Allopurinol	82.5	64.3	90.3	83.3	NS
Febuxostat	41.3	42.9	32.3	55.6	NS
Others	1.6	7.8	1.0	1.0	NS
Hyperuricemia target					
<6 mg/dL	77.8	71.4	74.2	88.9	NS
6.0-6.5 mg/dL	16.3	17.9	24.1	5.6	NS
6.5-7.0 mg/dL	5.9	10.7	1.7	5.5	NS

NS, not significant; W, women; M, men; AHU, asymptomatic hyperuricemia.

risk.²⁰ Internists often treat patients with dyslipidemia, and a *lipidology center* was found in the 46% of IMUs. These centers were able to perform an average of 300 to 1000 visits per year, with an average time of consultation greater than 15 min. Both HT and hypercholesterolemia are the result of an interaction between genetic and environmental factors, but dietary and behavioral factors have a predominant role in BP control and lipid homeostasis. Most internists considered lifestyle and diet modifications as the first step for the treatment of mild hypercholesterolemia. This approach, however, has an elusive long-term endpoint and non-pharmacologic therapy is neither simple nor consistently effective.²¹ In the last few decades, nutraceutical compounds (NCs) have been used in addition to diet as an alternative to lipid-lowering agents in HT patients at low CV risk.²² NCs were widely used in our study for the treatment of the mild hypercholesterolemia, particularly in the southern region. In addition to hypercholesterolemia, hypertriglyceridemia is considered an independent CV risk factor, but this association is far weaker than that of hypercholesterolemia.²³ However, no randomized trials providing evidence to derive target levels for triglycerides are available. Until now, mild hypertriglyceridemia - defined as serum triglyceride levels greater than 150 mg/dL - continue to be considered a marker of CV disease, particularly in subjects with low levels of high-density-lipoprotein cholesterol.²⁴ Lifestyle changes form the central pillar of management of mild to moderate hypertriglyceridemia (*i.e.*, 150 to 500 mg/dL). Although statins are not the most effective medication for reducing serum triglyceride levels, they are the most effective hypolipidemic agents for reducing CV risk and should thus probably be first-line agents for use in patients with mild to moderate hypertriglyceridemia. In contrast with the main guidelines, in our survey omega-3 fatty acid administration was considered first-line treatment of hypertriglyceridemia. Also, few IMUs used the Dutch score to diagnose FH and a third (36.5%) were unaware of FH treatment with PCSK9 inhibitors.

Screening for plasma SUA is widespread in many countries, including Italy.²⁵ Alongside gout or nephrolithiasis, hyperuricemia may be associated with and contribute to several cardiovascular, renal, and metabolic disorders.²⁶ Treatment of hyperuricemia may therefore - at least theoretically - be beneficial for global cardiovascular risk reduction, although there is still an open debate regarding a potential role for the treatment of AHU. The latter - a condition defined by SUA levels ≥ 6.8 mg/dL in which neither urate crystal deposition disease, such as gout, nor SUA renal disease occurs - is frequently underdiagnosed in clinical practice as different reference ranges of SUA are used.²⁷ In keeping with these data, only 39.7% of

IMUs correctly diagnosed AHU in this survey. We strongly believe in the importance of promoting continuing medical education courses with the aim of increasing knowledge about AHU in clinical practice. Most internists stated that AHU treatment is effective and confirmed the need to reach a goal treatment for SUA levels < 6 mg/dL. Allopurinol remains the first-line approach to AHU treatment,²⁸ although 50% of internists consider it useful treating AHU with febuxostat. Febuxostat can be used in patients with mild-to-moderate renal or hepatic involvement, which is frequently observed in internal medicine patients. In addition, febuxostat, is comparable to or, in certain subsets of patients with or without gout and with mild-to-moderate renal impairment, superior to allopurinol for its overall efficacy and safety profile.²⁹

Study limitations

The main potential limitation of this study was non-response bias. Physicians who responded to our survey were more interested in cardiovascular disease management compared to those who did not respond. In the same way, the internist who was more passionate about primary prevention of cardiovascular diseases might be more likely to be aware of tools used to calculate global CV risk and more likely to answer questions in agreement with the usefulness of global CV risk assessment. Another potential limitation is the sampling bias. Internists who are members of FADOI might be different to others who choose not to be members and, in consequence, our sample may not be representative of all internists. The cross-sectional design of the study was insufficient to determine the cause of the low use of CV global risk assessment in our sample.

Conclusions

In conclusion, global clinical assessment is a matter for *internists* managing patients with multiple cardiovascular risk factors and associated comorbidities. However, there are few guideline recommendations for these *complex* patients suffering from other concomitant diseases, treated with more drugs, or at greater risk of drug interactions or adverse drug reactions (*e.g.*, multiple antihypertensive therapies in patients with resistant hypertension). In other words, a more careful, multidimensional approach to cardiovascular risk is needed, based on the complexity of the profile of the individual patient rather than the current strategy of high CV risk alone. In consequence, internists should adopt a more proactive approach to becoming an expert on each *complex* patient, both in the primary and secondary prevention of cardiovascular disease. Finally, we would like to entrust the data of

this survey to the scientific community of internal medicine to evaluate the possibility of producing shared guidelines on the management of cardiovascular disease in the real world.

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