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ORIGINAL RESEARCH

Real-World Use of MART in Moderate–Severe Asthma: Results from the Italian WAMP Survey among Healthcare Professionals and Patients

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ABSTRACT

Introduction: Moderate–severe asthma affects a significant proportion of patients and poses challenges in symptom control and exacerbation prevention. The preferred track 1 endorsed by the Global Initiative for Asthma (GINA) recommendations offers a single-inhaler approach combining inhaled corticosteroids and formoterol for both maintenance and symptom relief (maintenance and reliever therapy; MART). However, MART's real-world adoption remains suboptimal and concerns regarding its correct implementation persist. "What About MART Posology" (WAMP) survey assessed the knowledge and clinical application of MART among Italian healthcare professionals (HCPs) and patients.

Methods: WAMP was a cross-sectional, web-based survey conducted among 1000 Italian HCPs and 400 patients with moderate–severe asthma. HCPs answered questions regarding treatment preferences, adherence to GINA recommendations and MART implementation.

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Patients reported on their therapeutic regimens, inhaler use, and adherence behaviors.
Results: Most HCPs demonstrated awareness of GINA recommendations. Pulmonologists (73.6%) and allergists (62.0%) reported favoring track 1, while general practitioners (GPs) showed greater variability (55.1%). Most of HCPs reported the use of inhaled corticosteroids (ICS)-formoterol, according to the MART approach, to manage moderate–severe asthma. GPs reported that approximately 45.5% of moderate–severe patients with asthma treated with ICS-formoterol inhaled therapy were also prescribed short-acting β2-agonists (SABA). Among patients, ICS-formoterol was the most reported regimen (59.7%), despite only 21.6% adhered to the MART approach correctly. Triple therapy was preferred for patients with recurrent exacerbations, yet its adoption was lower than expected.
Conclusions: The WAMP survey suggests a strong awareness of GINA track 1 among Italian HCPs. MART was widely implemented, particularly by specialists; patient data supported these findings. Gaps in education on MART's dual function persist though. Targeted training for HCPs and improved patient education are essential to optimize asthma management and adherence to evidence-based strategies.

Keywords: Maintenance and reliever therapy (MART); Inhaled therapy; Asthma; Moderate; Severe; Healthcare professional; Patient; Italy; Survey

Key Summary Points

Moderate–severe asthma presents challenges in symptom control and exacerbation prevention and, despite Global Initiative for Asthma (GINA) recommendations favoring maintenance and reliever therapy (MART), its real-world adoption and implementation may vary

The "What About MART Posology" (WAMP) survey aimed to assess the knowledge, implementation, and adherence to MART among Italian HCPs and patients, hypothesizing that differences in understanding and prescribing practices can influence asthma management outcomes.

Pneumologists and allergologists recommend MART to their patients more than GPs, showing greater adherence to GINA recommendations.

While MART was widely implemented, differences in prescribing patterns and therapeutic choices suggest the need for continued efforts to support optimal asthma management strategies in clinical practice.

INTRODUCTION

Asthma is a chronic inflammatory disorder of the airways characterized by recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, often worsening at night or in the early morning [1–3]. The pathophysiology of asthma involves a complex interplay of genetic and environmental factors that lead to hyperresponsiveness of the airways, resulting in inflammation, mucus hypersecretion, and structural changes over time [4–7]. The 2024 Global Initiative for Asthma (GINA) recommendations classify asthma severity into mild, moderate, and severe on the basis of the treatment strategy required to achieve symptom control and prevent exacerbations [3]. In particular, moderate–severe asthma (40–60% of all asthma cases) poses a considerable challenge owing to frequent exacerbations and higher healthcare costs of hospitalizations and emergency care visits [8–11].

Moderate asthma requires control with low-to-medium dose inhaled corticosteroids (ICS) combined with long-acting beta2-agonists (LABA), while severe asthma requires high-dose ICS-LABA therapy either to prevent the condition from becoming uncontrolled or to manage cases that remain uncontrolled, despite this

treatment. If asthma is not well controlled with medium or high dose ICS-LABA, GINA also suggests adding a long-acting muscarinic antagonist (LAMA). According to the GINA recommendations, two main therapeutic strategies are currently proposed for managing moderate–severe asthma: track 1 (also called MART, maintenance and reliever therapy) and track 2 (also called proactive regular dosing, PRD).

[12]. In the MART strategy (track 1), the ICS-formoterol combination in a single inhaler is used as a maintenance and reliever therapy. In contrast, PRD (track 2) employs short-acting β2-agonists (SABA) for symptom relief alongside regular ICS-LABA maintenance therapy. While both approaches aim to achieve asthma control and prevent exacerbations, MART demonstrated a reduced risk of exacerbation, and a potentially lower total ICS dose compared with fixed ICS-LABA maintenance therapy combined with as-needed SABA [13–21] or as-needed SABA-ICS [21].

The superior efficacy of the MART approach stems from its incorporation of ICS in every reliever dose, significantly lowering exacerbation risk and improving asthma control, particularly with formoterol as the rapid-acting agent. Accordingly, GINA recommendations from 2019 started suggesting the MART-based approach as the preferred treatment for the management of moderate–severe asthma over the PRD-based approach, which is considered to be an alternative [3, 22–24].

Despite the evidence behind this strategy and available recommendations, its adoption and implementation have been reported as quite low in clinical practice [12, 25–27]. Moreover, a perceived misapplication of MART was reported, with patients frequently supplementing it with SABA relievers, suggesting potential gaps in adherence or implementation [12].

To further evaluate these findings, the "What About MART Posology" (WAMP) survey aimed at providing a comprehensive overview of moderate–severe asthma management in Italy. The survey focused on assessing healthcare professionals' (HCPs) adherence to GINA recommendations and the preferred therapeutic approaches, with a particular focus on the overall perception and real-world use of MART compared with PRD strategies. WAMP also explored clinicians' and patients' perspectives on treatment, including the role of SABA, patient satisfaction with inhaler devices, and factors affecting adherence. Additionally, WAMP evaluated patient education on asthma, inhaler use, and disease severity to identify barriers and potential solutions to optimize therapy and outcomes.

This paper presents findings from HCPs alongside selected key results from the patients' survey, emphasizing treatment prescriptions and usage patterns.

METHODS

Study Design and Setting

WAMP (What About MART Posology) was a cross-sectional, voluntary, closed online survey involving HCPs and patients with moderate–severe asthma, conducted in Italy, aimed at assessing the awareness, implementation, and perspectives on MART. Data were collected through a computer-assisted web interviewing (CAWI) methodology, allowing for efficient and extensive data capture across different regions. The survey period extended from 12 June to 16 September 2024. The survey was conducted in accordance with the principles outlined in the Declaration of Helsinki, and informed consent was obtained from patients prior to their involvement. Ethics approval was not required for this study as it was based on a voluntary, anonymous survey of healthcare professionals and patients, without the collection of sensitive personal data or interventions affecting patient care, in accordance with applicable ethical guidelines and regulations.

Participants

The study targeted two distinct groups: (1) HCPs responsible for managing asthma treatments and (2) patients with a physician-diagnosed moderate–severe asthma.

For the HCPs cohort, eligibility required asthma management within the prior 90 days. This group comprised pulmonologists, allergists,

and general practitioners (GPs), ensuring a representative sample of HCPs involved in asthma care across Italy.

Patients eligible for the study were aged 18 years or older with a confirmed diagnosis of moderate–severe asthma. They were current users of maintenance therapies involving combinations, such as ICS-LABA or ICS-LABA-long-acting anticholinergic agent (LAMA), aligning with standard treatment protocols for moderate–severe asthma.

Survey Instruments

Two *ad-hoc* surveys were designed to report the specific experiences and viewpoints of HCPs and patients. The questions were structured and finalized under the supervision of a Scientific Board, with the aim of shedding light on the diagnostic and therapeutic process of moderate–severe asthma.

The HCPs survey consisted of 21 questions, while the patient survey contained 28 questions (see Annex I and Annex II for the full text of both surveys).

The HCPs survey collected data on:

- Patient characteristics: description and clinical information on the types and severity of asthma cases managed;
- Treatment pathways: knowledge of GINA recommendations, particularly track 1 (MART strategy) versus track 2 (maintenance ICS with as-needed SABA) differences, and preferential asthma management strategies;
- Key priorities in therapy selection include symptom control, reduction of exacerbations, and single-inhaler regimens.

The patient survey focused on:

- Demographics and treatment profiles;
- Symptom management and treatment modalities;
- Access to care and educational needs.

The present paper addresses the results from the HCPs' survey and some key results from the patients' survey, with a focus on treatment prescription and modalities. The full analysis of the patients' survey will be the topic of a future publication.

Statistical Analysis

The sample size was defined to ensure a robust study power (with a margin of error of $< 5\%$) that could also allow for detailed analyses for subgroups (both at the level of HCPs and patients) and better clarity and accessibility at the territorial level. The survey responses were analyzed using descriptive statistics, with particular emphasis on group comparisons within HCPs specialties and patients' subgroups. The significance of the differences between mean values (in absolute and percentage terms) was assessed using the Student's *t*-test. Significant differences between groups were determined at a 95% confidence level ($p < 0.05$), and these differences were highlighted where applicable. However, because of the descriptive nature of the study, no correction for multiple comparisons was done. Therefore, "significance" should be interpreted as exploratory results.

RESULTS

Healthcare Professionals (HCPs)

A total of 2484 HCPs contacts were recorded. Of these, 463 were screened out because they did not meet the inclusion criteria. A further 677 HCPs opened the survey link but abandoned the questionnaire immediately after access. In addition, 344 interviews were interrupted: 292 were terminated during the screening phase, while 52 were interrupted during the main questionnaire, despite having passed the initial screening. Thus, the final HCPs sample consisted of 1000 Italian participants actively involved in the management of asthma treatment. This cohort included 337 pulmonologists (33.7%), 113 allergists (11.3%), and 550 GPs (55.0%). Participants were geographically representative of the national distribution of HCPs across Italy, with a clinical experience of approximately 20 years.

Patient Case Description by HCPs

Pulmonologists and allergists managed a significantly higher number of patients over the preceding 90 days compared with GPs ($p<0.05$), with a mean (SD) of 131.9 (108.6) and 110.9 (94.1) patient visits, respectively, versus 30.8 (23.5) for GPs. Across all HCP categories, moderate–severe asthma requiring daily management represented the predominant case profile, with pulmonologists treating the highest proportion of such patients (76.3%), followed by allergists (68.5%) and GPs (56.8%) (Fig. 1).

Therapeutic Pathway

Most of the HCPs, in particular pulmonologists (73.6%) and allergists (62.0%), reported a strong knowledge of the GINA recommendations, particularly concerning the track 1 treatment pathway for adults and adolescents with asthma. Among HCPs who reported a lack of knowledge of the GINA recommendations, GPs constituted the highest proportion (14.5%, $p<0.05$). The majority of HCPs identified track 1 as the preferred treatment approach for managing moderate–severe asthma and a significantly higher percentage of GPs (17.1%, $p<0.05$) favored track 2 compared with pulmonologists (6.8%) and allergists (6.2%).

Track 1 was favored by most pulmonologists (71.4%; $p<0.05$ versus GPs), allergists (68.3%), and GPs (61.8%) for the management of patients with moderate–severe asthma. Track 2 was used to a lesser extent across specialties, especially among pulmonologists, with only 28.6% favoring it compared with 31.7% of allergists and 38.2% ($p<0.05$ versus pulmonologists) of GPs (Fig. 2).

Factors Driving the Track Preference

Several factors drive the preference for track 1 among HCPs (Table 1). A predominant reason was the preference for an association ICS-formoterol over SABA as a reliever, as particularly emphasized by pulmonologists (63.8%; $p<0.05$ versus GPs) and allergists (54.0%; $p<0.05$ versus GPs). Additionally, the convenience of a single-device treatment was recognized as a significant advantage (58.2% of pulmonologists and 62.8% of allergists, $p<0.05$ versus GPs; 39.8% of GPs; refer to Table 1 for the full list of factors).

The primary motivation for selecting track 2 was the failure of track 1 in achieving adequate asthma control, cited by 34.1% of pulmonologists, 31.9% of allergists, and 38.0% of GPs (Table 2). Another key factor was the use of medication with a one-daily administration modality, favored in particular by 39.8% ($p<0.05$) of allergists compared with 28.2% ($p<0.05$ versus GPs) of pulmonologists and 14.5% of GPs. Symptom severity and patient compliance also influenced the choice of track 2, especially among allergists and GPs (refer to Table 2 for the full list of factors).

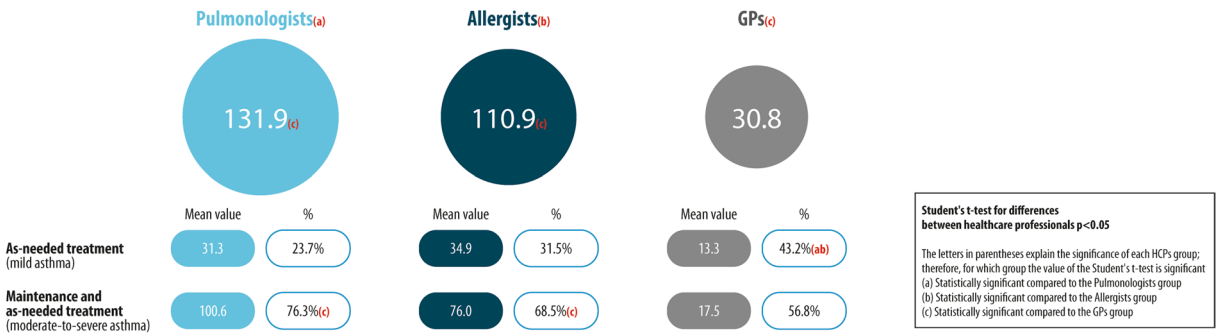

Fig. 1 Distribution of the HCPs study sample according to the asthma treatment modality. Statistical significance: **a–c** $p<0.05$. *GPs* general practitioners

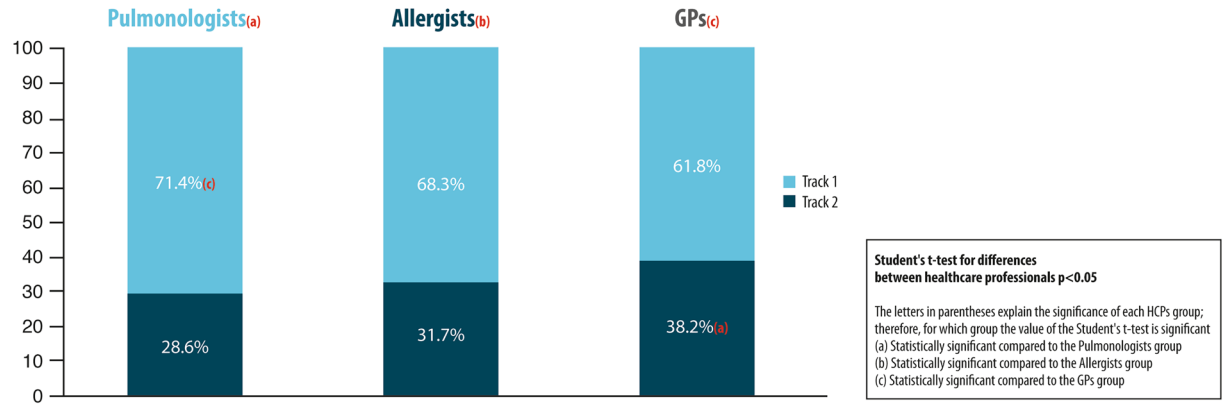

Fig. 2 Preferred treatment pathways for the management of moderate–severe asthma patients. Light Blue: track 1; blue: track 2. Statistical significance: **a–c**: $p < 0.05$. *GPs* general practitioners

Table 1 Factors driven the preference for track 1 among Italian HCPs

Factors	Pulmonologist (%)	Allergist (%)	GP (%)
Preference for ICS-LABA over SABA	63.8*	54.0*	38.7
Greater compliance for the patient/single device	58.2*	62.8*	39.8
Recommended by guidelines	44.8*	38.1	29.5
Greater symptom efficacy	37.7	33.6	33.3
Greater efficacy in exacerbation control	37.7*	35.4	26.9
Higher compliance	35.3	41.6	40.7
Greater anti-inflammatory action	29.7*	27.4	22.0
Greater efficacy in airway impairment	22.0*	21.2*	13.5
Patients with mild symptoms	12.8	21.2**	21.6
Patients with severe symptoms	9.8*	12.4*	6.0
Failure of track 2	5.0	6.2	5.3

*Statistically significant compared with GPs ($p < 0.05$)

**Statistically significant compared with pulmonologists ($p < 0.05$)

Treatment Options for Uncontrolled Patients

The use of ICS-formoterol as maintenance and reliever therapy within a single inhaler (MART approach) to manage moderate–severe asthma was reported by 76.7% of pulmonologists, 73.4% of allergists, and 61.0% of GPs (GPs, $p < 0.05$) (Fig. 3A). Moreover, the majority of pulmonologists (87.2%) and allergists (87.6%), as well as a significant proportion of GPs (74.2%, $p < 0.05$), correctly identified MART as a regimen in which the same inhaler is used both for maintenance therapy and as needed for symptom relief.

Pulmonologists and allergists reported the highest adherence to the correct MART posology, with 85.2% and 76.1% of them, respectively, prescribing ICS-formoterol without the addition of SABA. GPs were more likely to supplement MART with SABA (45.5%; $p < 0.05$ vs. pulmonologists and allergists), and a higher

Table 2 Factors driving the preference for track 2 among Italian HCPs

Factors	Pulmonologist (%)	Allergist (%)	GP (%)
Failure of track 1	34.1	31.9	38.0
Use of medication in a single administration	28.2*	39.8*/**	14.5
Patients with mild symptoms	20.8*	21.2*	13.3
Higher compliance	20.5	24.8*	15.5
Patients with severe symptoms	13.4	12.4	24.7**/***
Greater efficacy in exacerbation control	13.4	11.5	23.6**/***
Greater symptom efficacy	13.1	11.5	20.4**/***
Greater anti-inflammatory action	12.5	13.3	18.0**
Recommended by guidelines	12.2	13.3	17.1**
Greater efficacy in airway impairment	9.8	8.0	15.5**

*Statistically significant compared with GPs ($p < 0.05$)

**Statistically significant compared with pulmonologists ($p < 0.05$)

***Statistically significant compared with allergists ($p < 0.05$)

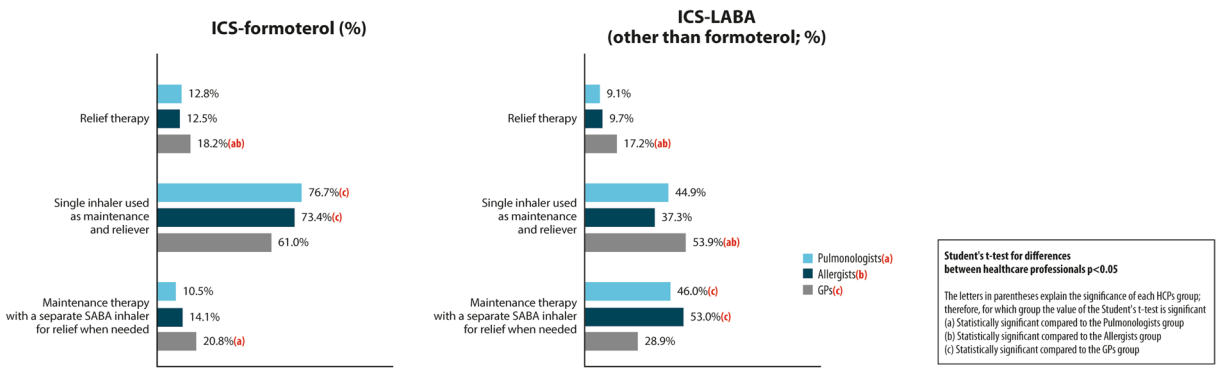

Fig. 3 Reported therapeutic approaches used to manage patients with moderate–severe asthma. Statistical significance: **a–c** $p < 0.05$. *ICS* inhaled corticosteroids, *GPs* general practitioners, *LABA* long-acting β2-agonists, *SABA* short-acting β2-agonists

percentage of them (20.8%, $p < 0.05$ versus pulmonologists) reported the use of ICS-formoterol as a maintenance therapy with a separate SABA inhaler for relief when needed (Fig. 3A). Administration of ICS-formoterol with the sole relief purpose was reported by a minority of specialists (Fig. 3A).

With regard to other ICS-LABA combinations (other than formoterol), a significant proportion of pulmonologists (46.0%) and allergists (53.0%) reported using this treatment as maintenance therapy with an additional SABA inhaler for symptom relief, compared with 28.9% ($p < 0.05$) of GPs (Fig. 3B). The administration with a sole relief purpose was reported mostly by GPs (17.2%, $p < 0.05$ versus specialists) (Fig. 3B), and the use of ICS-LABA combinations as maintenance and reliever therapy with a single-inhaler approach (other than formoterol) was reported by the 44.9% of pulmonologists, 37.3% of

allergists and 53.9% of GPs ($p < 0.05$ versus specialists) (Fig. 3B).

SABA was primarily valued for its immediate symptom relief, mainly by pulmonologists ($p < 0.05$), and for the patients' accessibility. Flexibility in dosing was particularly valued by GPs ($p < 0.05$). Ease of prescription was identified as a strength by around 20% of HCPs, while long-lasting action features of the treatment and the absence of steroids were reported at lower percentages and, in particular, by GPs ($p < 0.05$). ICS-formoterol was appreciated for its flexibility in dosing, quick symptom relief, and the presence of a steroid component, in particular by specialists ($p < 0.05$ versus GPs). The long-lasting action feature was also reported as a strength, mainly by pulmonologists ($p < 0.05$). Ease of prescription and patients' accessibility were less reported by HCPs.

The preferred stepping-up approaches reported for uncontrolled moderate–severe asthmatic patients were increasing the dosage of ICS and the addition of a LAMA as part of single inhaler triple therapy (Fig. 4).

The addition of a LAMA as part of triple therapy in patients on a medium-dose ICS-LABA regimen experiencing at least one exacerbation in the previous year was the reported preferred therapeutic intervention (57.9% pulmonologists, 56.6% allergists, 51.8% GPs) (Fig. 5).

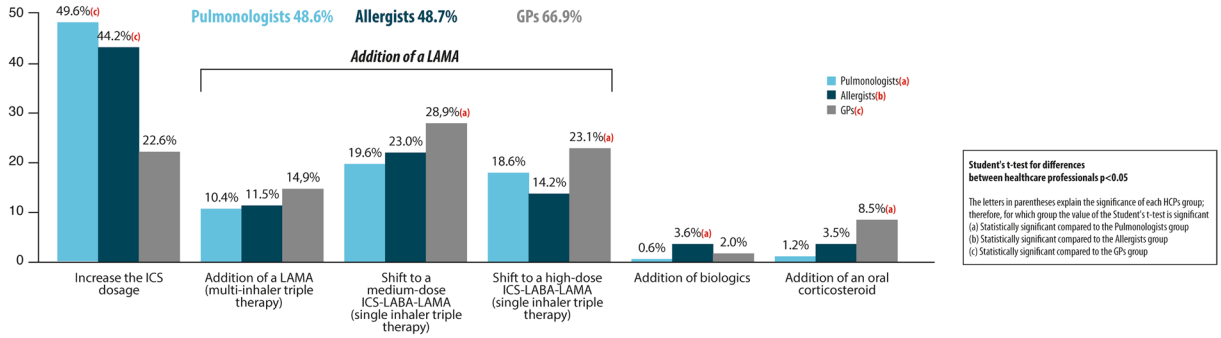

Fig. 4 Proposed therapeutic approach for the management of a patient with moderate–severe asthma and continued symptoms despite being on a medium-dose ICS-LABA regimen. Statistical significance: **a–c** $p < 0.05$. *GPs* general practitioners, *ICS* inhaled corticosteroids, *LABA* long-acting β2-agonists, *LAMA* long-acting muscarinic antagonist, *SABA* short-acting β2-agonists

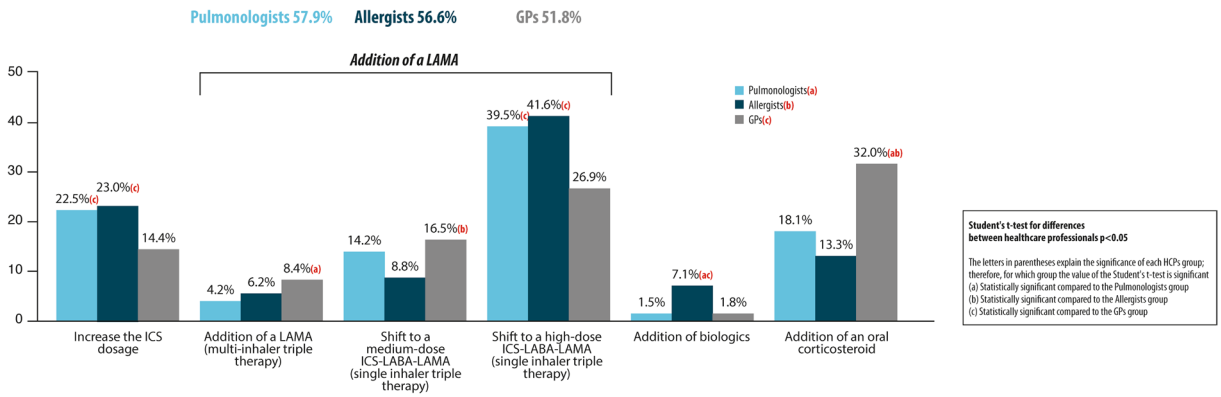

Fig. 5 Proposed therapeutic approach for the management of a patient with moderate–severe asthma and exacerbation despite being on a medium-dose ICS-LABA regimen. Statistical significance: **a–c** $p < 0.05$. *GPs* general practitioners, *ICS* inhaled corticosteroids, *LABA* long-acting β2-agonists, *LAMA* long-acting muscarinic antagonist, *SABA* short-acting β2-agonists

Factors Reported to Drive the Choice of MART Versus PRD Strategies

Once-daily dosing was rated as highly or moderately useful by most HCPs. At the same time, multiple-daily dosing was seen as beneficial by most pulmonologists (76.9%), allergists (70.8%) and GPs (69.5%). The use of a single inhaler therapy was considered relevant for adherence to treatment for the vast majority of HCPs. Ease of use was another valued aspect, noted by 58.8% of pulmonologists, 67.3% of allergists and 55.5% of GPs. Additionally, reducing the risk of errors was reported as significant by 49.0% of pulmonologists, 41.6% of allergists, and 35.3% of GPs.

The primary objective for HCPs in selecting asthma therapy for moderate–severe cases was to reduce exacerbations, a goal shared across all specialties, with allergists (86.1%), pulmonologists (82.4%), and GPs (80.7%) ranking it highest. Symptom reduction was also reported as crucial, with approximately 76% of each specialty prioritizing it. Pulmonologists and allergists additionally emphasized corticosteroid reduction (51.2% and 45.8%, respectively), while GPs (57.9%) focused more on improving lung function as the third priority.

Patients

The patient sample included 400 individuals undergoing continuous treatment for at least one month with ICS-LABA or ICS-LABA-LAMA, evenly distributed throughout the national territory and across different urban and rural settings. Specifically, 29.7% of respondents lived in cities, 29.7% in small towns, 18.0% in city centers of large metropolitan areas, and 16.3% in peripheral urban zones. Additionally, 5.3% resided in rural areas. The mean (SD) age was 44 (12.4) years, and the mean (SD) age of diagnosis was 23 (15.5) years. Males and females were 42.0% and 57.5% of the cohort, respectively (0.5% did not indicate their sex). The majority reported having completed either secondary school (48.4%) or university education (41.8%). A smaller proportion held only a lower secondary school certificate (8.8%). Among respondents, 40.3% reported smoking regularly, and 46.5% lived with a smoker.

Treatment and Therapeutic Schemes

Among patients undergoing continuous treatment with ICS-LABA or ICS-LABA-LAMA, in terms of drug classes, ICS-formoterol was the most reported treatment (59.7%), followed by ICS-LABA (other than formoterol; 47.7%). SABA additional therapy was reported by 31.7% of patients, followed using ICS (24.7%).

In terms of therapeutic regimen, the use of ICS-formoterol alone was reported by 29.8% of patients, followed by ICS-LABA (other than formoterol, 18.8%). Other reported combinations included ICS-formoterol with SABA (9.8%) and ICS-LABA (other than formoterol) with SABA (7.2%).

Most of the respondents (37.2%) reported using a single inhaler for daily maintenance. Another 33.2% reported the use of one inhaler for daily maintenance and a separate one for relief, whereas 15.8% reported using only one relief inhaler when necessary; 13.8% of patients reported the use of the same inhaler for both maintenance and symptom relief.

Most of the patients (39.4%) prescribed with ICS-formoterol used a single inhaler for daily maintenance, while 29.6% utilized one inhaler for daily maintenance and a separate inhaler for relief purposes (Fig. 6). Among those prescribed with ICS-LABA (other than formoterol), 41.0% used a single inhaler exclusively for daily maintenance, while 36.6% utilized one inhaler for daily maintenance and a separate inhaler for as-needed symptom relief (Fig. 6).

DISCUSSION

The WAMP study explored the real-world awareness and application of MART among Italian HCPs and patients with moderate–severe asthma, focusing on adherence to GINA recommendations and treatment preferences. Overall, 1000 HCPs (55% GPs, 34% pulmonologists and 11% allergists) and 400 patients with asthma from Italy answered the survey.

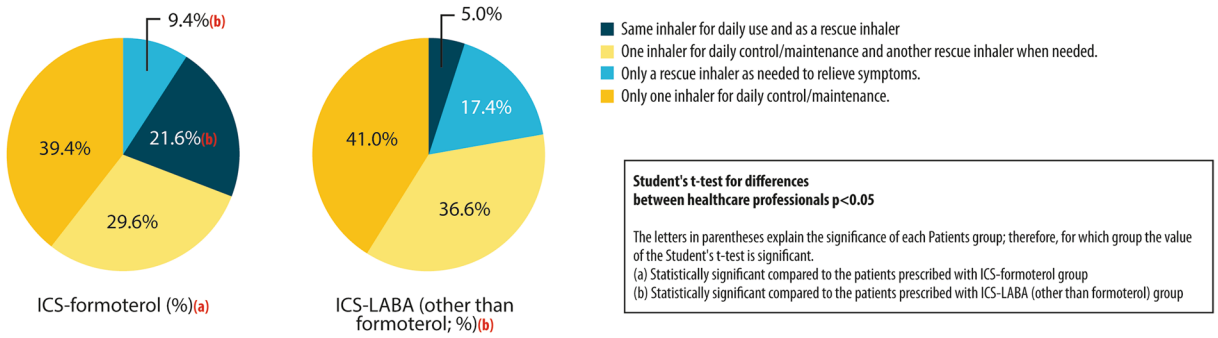

Fig. 6 Description of the prescribed treatment regimen. Statistical significance: **a**, **b** $p < 0.05$. *ICS* inhaled corticosteroids, *LABA* long-acting β2-agonists

HCPs reported the management of mainly patients with moderate–severe asthma needing daily management; a higher percentage of patients with mild asthma was treated by GPs ($p<0.05$), compared with specialists, as expected.

A generally high awareness of GINA recommendations among Italian HCPs was reported, with most pulmonologists (73.6%) and allergists (62.0%) indicating track 1 as the preferential therapeutic scheme for moderate–severe patients with asthma, representing a significantly higher percentage if compared with GPs (55.1%; $p<0.05$). At the same time, a significantly higher percentage of GPs ($p<0.05$) compared with specialists reported track 2 as preferential.

Accordingly, in the clinical practice, track 1 was favored by the majority of pulmonologists (71.4%, $p<0.05$ versus GPs), allergists (68.3%), and GPs (61.8%); track 2 was used to a lesser extent, especially among pulmonologists, with only 28.6% favoring it compared with 31.7% of allergists and 38.2% ($p<0.05$ versus pulmonologists) of GPs.

It is worth mentioning that the adoption of MART as the preferred asthma management strategy is relatively recent. While the 2018 GINA Report treated MART as equivalent to maintenance therapy plus as-needed SABA, the 2019 recommendation, for the first time, mentioned the superiority of ICS-formoterol as a reliever [22–24]. By 2020, ICS-formoterol was still recognized as the preferred reliever, but only from GINA Report 2021 clearly distinguished and recommended track 1 (MART) as preferred and track 2 as an alternative [23, 24]. Notably, the emphasis on MART is also reflected in the US guidelines, which have only recently centered on MART since 2020–2021, and the UK guidelines, which similarly align with this perspective [28, 29]. These timelines underscore that the concept of MART as the dominant therapeutic strategy is relatively new, possibly explaining the variability in its implementation across different clinical settings within the WAMP survey.

A substantial majority of HCPs accurately defined MART as a dual-purpose inhaler regimen used for both maintenance and symptom relief. Despite this, about 22% of GPs misunderstood MART, describing it as maintenance therapy with additional SABA, which could indicate a need for clearer guidance on MART's dual function.

In clinical practice, MART was commonly used by all HCP categories, in line with the above data on MART awareness. Analyzing the use of ICS-formoterol therapy, MART emerged as the preferred approach by all HCPs categories, in line with literature evidence on MART efficacy on symptom control [21]. However, specialists were more likely to prescribe ICS-formoterol alone, suggesting its use according to the MART dosing regimen, likely reflecting their management of patients with generally more severe asthma. On the other hand, GPs demonstrated a higher rate of prescribing ICS-formoterol as a maintenance therapy with a separate SABA inhaler for relief, potentially reflecting a more traditional approach to asthma management. This practice aligns with GINA track 2 recommendations and the summary of product

characteristics [30] for ICS-formoterol medications. It is noteworthy that MART became the preferred choice in GINA recommendations as recently as 2019, which may contribute to the persistent use of the ICS-formoterol plus SABA combination in clinical practice [22–24]. This residual use is also reflected in a recent prospective observational study conducted in Poland [31]. At baseline, 75% of patients treated with ICS-formoterol were managed using the MART regimen ($n=1174$) compared with those on maintenance dosing alone ($n=1560$). Over 4 months, this trend reversed, with the number of patients on MART ($n=1447$) exceeding those on maintenance dosing ($n=1253$), representing 115% of the baseline value by the final visit [31]. This shift highlights a gradual but significant transition toward the adoption of MART as a preferred strategy in real-world practice.

GPs were more inclined to adopt ICS-LABA combinations (other than formoterol) within a single inhaler approach for both maintenance and relief purposes ($p<0.05$ compared with specialists). This approach for ICS-LABA (other than formoterol) combinations represents an off-label misapplication of MART, with contraindications for the patient.

With regard to the management of patients with recurrent symptoms while on a medium-dose ICS-LABA regimen, pulmonologists reported acting more on the reduction of inflammation, while a unanimous position emerged in optimizing inhaled therapy before switching to biologics or systemic steroids. If the same patient type presents with exacerbations, the addition of a LAMA as part of a triple therapy was suggested by most HCPs. A high rate of use of oral steroids was found among GPs, which, however, should be the last option to prescribe due to the known side effects. At the same time, a less consolidated use of triple therapy emerged, underlining the relative novelty of this approach: if the demonstration of the validity of the use of tiotropium in asthma dates back to 2012 [32], the concept of ICS-LABA-LAMA combinations ("triple therapy") for patients aged ≥ 18 years, i.e., with LAMA added to medium or high dose ICS-LABA is—for the first time—only in the GINA Report 2021 [26]. Additionally, it must be emphasized that the reimbursement by the National Health System of the so-called MITT (multi-inhaler triple therapy) dates back several years ago, but the reimbursement of the more practical SITT (single-inhaler triple therapy) in Italy dates back only to 2023. For instance, in Italy, to date the prescription of SITT is limited to specialists (within a therapeutic plan).

Obtained results suggest that the once-daily dosing was overall considered moderately useful, with the multiple-daily dosing reported as beneficial by most pulmonologists (76.9%); the reduction of exacerbations was reported as the main goal of therapy across all HCPs specialties, instead of symptoms reduction and control, as previously reported [12].

The patient sample included 400 individuals undergoing continuous treatment for at least 1 month with ICS-LABA or ICS-LABA-LAMA. The most reported treatment in terms of drug classes was ICS-formoterol, and the most commonly reported regimen was ICS-formoterol alone.

Among ICS-formoterol users, a notable proportion (21.6%) used the same inhaler for both daily maintenance and as-needed relief, a hallmark of the MART approach, while 39.4% used a single inhaler exclusively for daily maintenance. In contrast, ICS-LABA (other than formoterol) users were significantly less likely to use the same inhaler for both purposes (5.0%, $p<0.05$) and more likely to rely solely on a rescue inhaler for symptom relief (17.4%, $p<0.05$). These findings suggest that patients who received ICS-formoterol were more likely to adopt MART-style regimens, whereas ICS-LABA (other than formoterol) prescriptions were associated with more traditional, separate inhaler use for maintenance and rescue purposes. This reflects differing therapeutic strategies and highlights the continued need for alignment with guideline-recommended practices.

Findings from the WAMP study present some divergences from previous recent studies investigating the patients' and physicians' perspectives on the burden and management of asthma, particularly concerning the real-world application and alignment with GINA treatment tracks [12, 26]. In particular, the WAMP analysis reported a gradual adoption of MART in specific clinical settings, suggesting improved integration of GINA track 1 recommendation in asthma

management compared with previous evidence [26]. Furthermore, our findings reported higher adherence to the MART regimen as designed, with fewer instances of inappropriate SABA use compared with previous data [12]. For instance, in interpreting this result, it is also important to underline that the WAMP study reported the widest sample with regard to the component of Italian participants (1000 HCPs and 400 patients) than in previous studies [12].

Study Limitations

This study presents some limitations. First, as with all survey-based research, findings rely on self-reported data, which may be subject to recall bias or social desirability bias. Second, the voluntary nature of participation may have introduced a selection bias, despite the use of rigorous screening criteria and stratified sampling to ensure representativeness. Lastly, owing to the descriptive nature of the analysis, findings should be interpreted as hypothesis-generating rather than confirmatory.

CONCLUSIONS

The WAMP survey highlights a substantial awareness of the GINA-recommended track 1 treatment strategy among Italian HCPs, with particularly high adherence among pulmonologists and allergists. Furthermore, the appropriate implementation of MART was widely reported, especially among specialists, reinforcing its role as a preferred strategy for managing moderate–severe asthma. GPs demonstrated a slightly different prescribing pattern compared with specialists, with a greater tendency to adopt ICS-LABA combinations (other than formoterol) within a single-inhaler regimen for both maintenance and symptom relief. While this approach may reflect efforts to tailor treatment to individual patient needs, it represents an off-label use that does not align with SmPC and MART principles and may expose patients to suboptimal management strategies. Findings from the patient survey further support these observations, showing that ICS-formoterol was the most commonly prescribed treatment and a considerable proportion of patients adhered correctly to the MART regimen. However, a potential gap in patient education regarding MART's dual function and the benefits of a single-inhaler approach emerged. This underscores the need for targeted educational initiatives aimed at enhancing HCPs' correct application of MART while also improving patient education to reinforce adherence to evidence-based treatment strategies, ultimately optimizing asthma management and outcomes.

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Data Availability. The datasets generated and analyzed during the current study are

available from the corresponding author upon reasonable request.

Declarations

Conflict of Interest. Matteo Bonini has received research grants, advisory board honoraria, consultancy fees, and lecture fees from AstraZeneca, Chiesi Farmaceutici, Grifols, GlaxoSmithKline, Lallemand Health Solutions, Lusofarmaco, Menarini Group, Omron Healthcare, and Sanofi. Francesco Paolo Lombardo has received consultancy and lecture fees from Chiesi Farmaceutici, GlaxoSmithKline, and AstraZeneca. Walter Castellani, Marco Contoli, Andrea Claudio Comel, Fulvio Braido, Antonio Spanevello, and Alessandro Vatrella have nothing to disclose.

Ethics Approval. The survey was conducted in accordance with the principles outlined in the Declaration of Helsinki, and informed consent was obtained from patients prior to their involvement. Ethics approval was not required for this study as it was based on a voluntary, anonymous survey of healthcare professionals and patients, without the collection of sensitive personal data or interventions affecting patient care, in accordance with applicable ethical guidelines and regulations.

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