



**Maintenance And
Reliever Therapy
(MART)
improves asthma
control in moderate to
severe Asthma**



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Outlines

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STUDY BACKGROUND



"ขอให้ถือประโยชน์ส่วนตัว เป็นที่สอง
ประโยชน์ของเพื่อนมนุษย์ เป็นกิจที่หนึ่ง
ลาก ทรัพย์ และเกียรติยศ จะตกแก่ท่านเอง
ถ้าท่านทรงธรรมแห่งอาชีพ ไว้ให้บริสุทธิ์"

พระราชดำรัส

สมเด็จพระมหิตลาธิเบศรยโศภนบดี วิทยาลัยวิศวกรรม พระบรมราชชนก

Factors leading to asthma deaths

- 1. Inadequate treatment with inhaled corticosteroids**
- 2. Heavy and increasing use of beta2-agonists**
- 3. Inadequate follow-up**
- 4. Inappropriate prescription of beta-blockers & NSAIDs (failure to ask about past reactions)**

SIGN 141 • British guideline on the management of asthma

A national clinical guideline

October 2014



Patient miss concept of Asthma

treatment
Patients believe that “My reliever gives me control over my asthma”

- **Regular or frequent use of SABA is associated with adverse effects**
 - β -receptor downregulation, decreased Broncho protection, rebound hyperresponsiveness, decreased bronchodilator response
- **Higher use of SABA is associated with adverse clinical outcomes**
 - Dispensing of ≥ 3 canisters per year (average 1.7 puffs/day) is associated with higher risk of emergency department presentations (Stanford, AAAI 2012)
 - Dispensing of ≥ 12 canisters per year is associated with higher risk of death

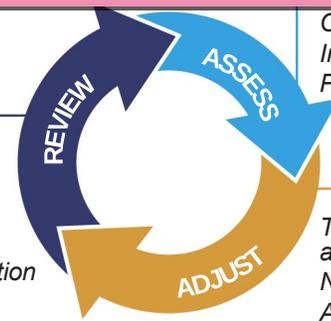
(Suissa, AJRCCM 1994)



GINA 2022

**Adults & adolescents
12+ years**

ICS-formoterol as reliever reduces the risk of exacerbations compared with using a SABA reliever



Track 1

CONTROLLER and PREFERRED RELIEVER (Track 1). Using ICS-formoterol as reliever reduces the risk of exacerbations compared with using a SABA reliever

prn Low - ICS/For

STEPS 1 - 2
As-needed low dose ICS-formoterol

Low - ICS/For

STEP 3
Low dose maintenance ICS-formoterol

Med - ICS/For

STEP 4
Medium dose maintenance ICS-formoterol

High - ICS/For + LAMA +/- Others

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider high dose maintenance ICS-formoterol, ± anti-IgE, anti-IL5/5R, anti-IL13, anti-TSLP

RELIEVER: As-needed low-dose ICS-formoterol

Track 2

CONTROLLER and ALTERNATIVE RELIEVER (Track 2). Before considering a regimen with SABA reliever, check if the patient is likely to be adherent with daily controller

prn ICS

STEP 1
Take ICS whenever SABA taken

Low ICS

STEP 2
Low dose maintenance ICS

Low-ICS/LABA

STEP 3
Low dose maintenance ICS-LABA

M/H-ICS/LABA

STEP 4
Medium/high dose maintenance ICS-LABA

High-ICS/LABA + LAMA +/- Others

Add-on LAMA
Refer for assessment of phenotype. Consider high dose maintenance ICS-LABA, ± anti-IgE, anti-IL5/5R, anti-IL4R, anti-TSLP

RELIEVER: As-needed short-acting beta₂-agonist

Other controller options for either track (limited indications, or less evidence for efficacy or safety)

	Low dose ICS whenever SABA taken, or daily LTRA, or add HDM SLIT	Medium dose ICS, or add LTRA, or add HDM SLIT	Add LAMA or LTRA or HDM SLIT, or switch to high dose ICS	Add azithromycin (adults) or LTRA. As last resort consider adding low dose ICS but consider side-effects
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See GINA severe asthma guide

Objectives of

A primary outcome is to explore asthma control.

And secondary outcome is to explore

- Compliance and Completeness to use inhaler devices,
- Severe exacerbation,
- Necessity for systemic glucocorticoid usage in 6 months.
- Need for add on new drug classes to the existing treatment regimen.



STUDY DESIGN





Inclusion & Exclusion criteria

Inclusion:

- Moderate to severe Asthma patient in Asthma Clinic of King Chulalongkorn Hospital (KCMH)
- Treatment in step 3-5 of GINA guideline

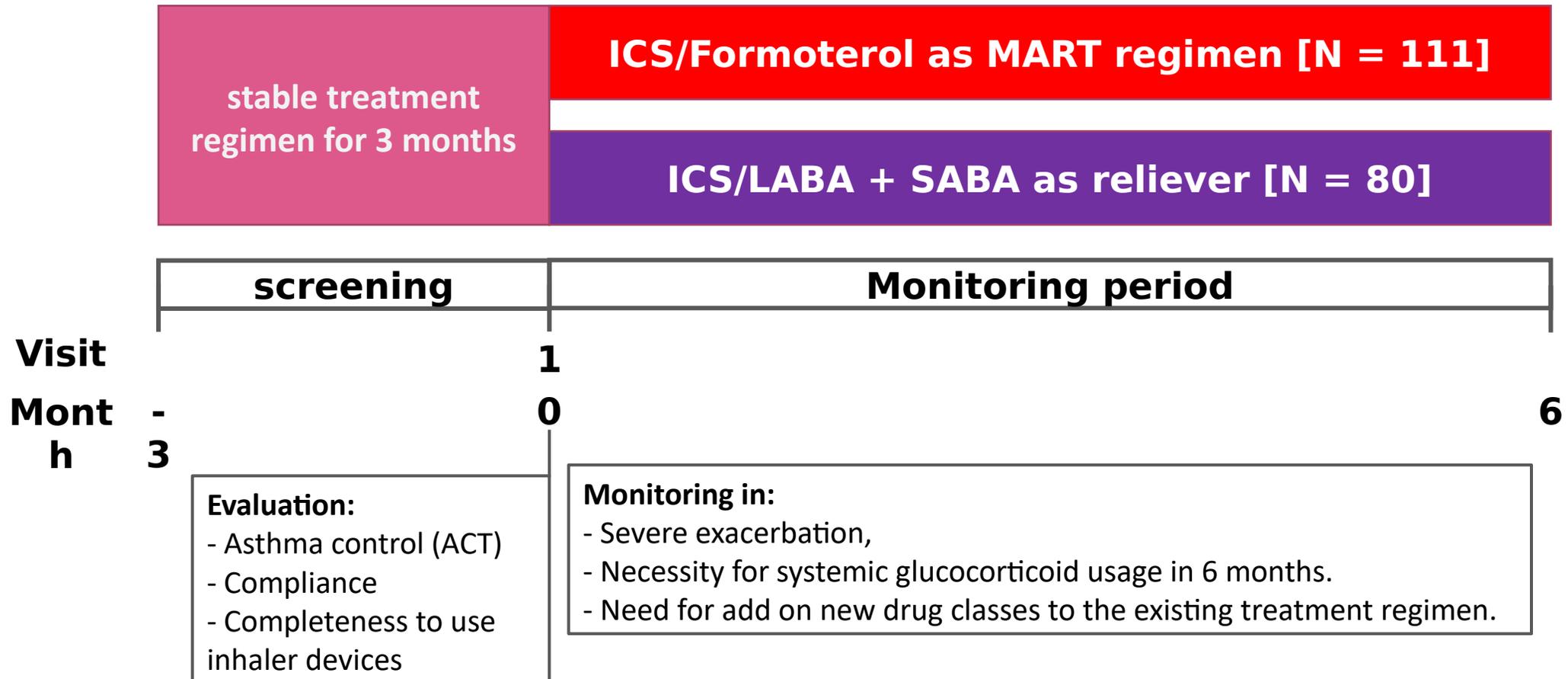
Exclusion:

- Patient can not use the inhaler device independently
- Patient treatment with anti-IgE, anti-IL5/5R, anti-IL4R, anti-TSLP and HDM SLIT
- Patient use a long-term systemic steroid

Study design

6 months, Prospective, Cross-sectional, Single center study (KCMH)

from 1 October 2021 to 30 September 2022 [N = 191]



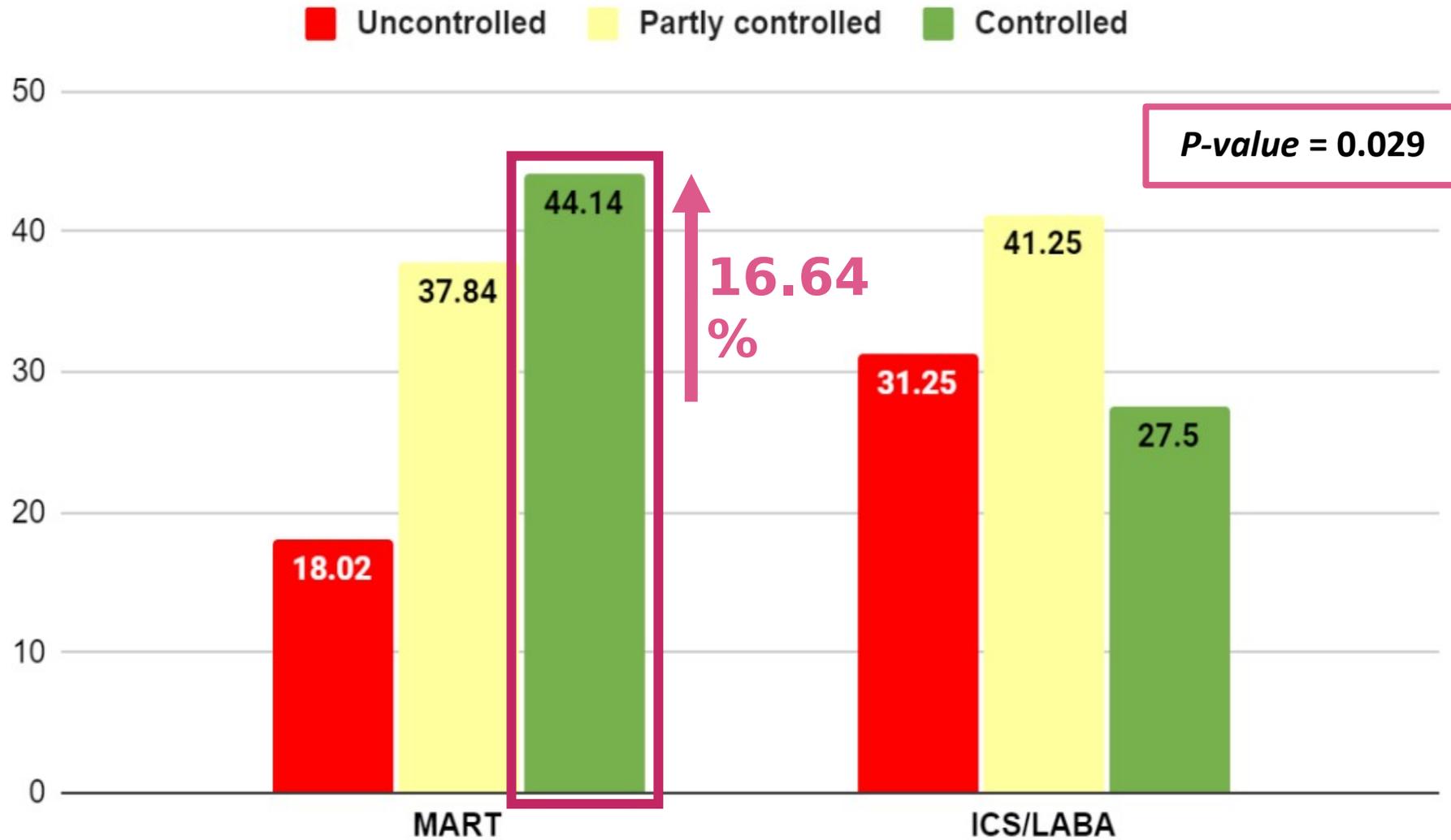
Study Results



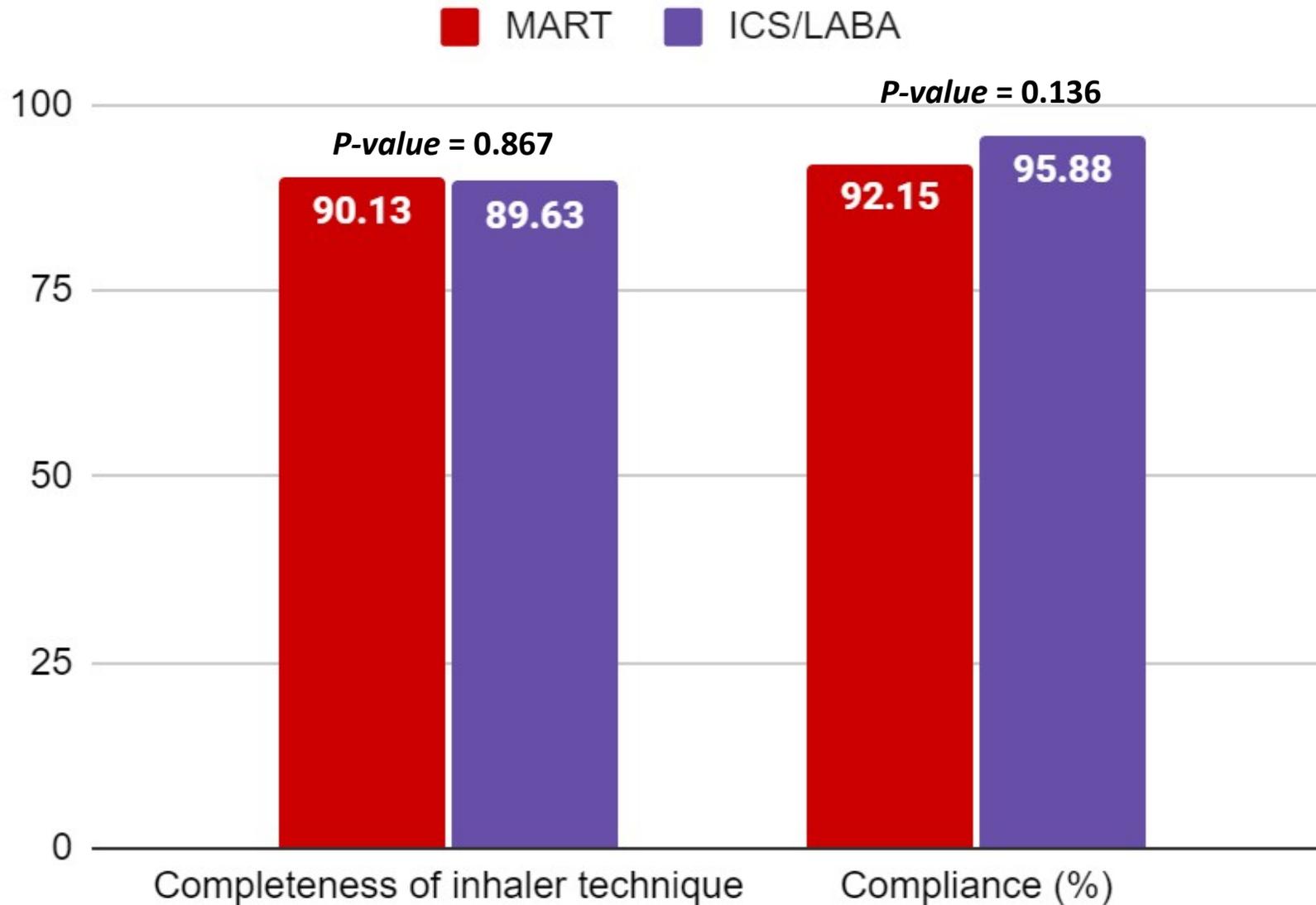
Demographic data

Characteristics	MART (N = 111)	ICS/LABA (N = 80)	p-value	Total (N = 191)
Age (years)	58.98 ± 14.05	67.85 + 10.95	<0.001	63.42 ± 12.5
Gender				
- Male (%)	36 (32.43)	24 (30)	0.721	60 (31.41)
- Female (%)	75 (67.57)	56 (70)		131 (68.59)
Body weight (Kg)	67.32 ± 21.35	65.25 ± 10.84	0.452	
Comorbidities				
- AR (%)	42 (37.84)	48 (60)	0.003	90 (47.12)
- OSA (%)	11 (9.9)	19 (23.75)	0.01	30 (15.71)
- Obesity (%)	32 (28.83)	28 (35)	0.365	60 (31.41)
- GERD (%)	9 (8.11)	16 (20)	0.016	25 (13.09)
Other drugs in the patient treatment regimen				
- LAMA (%)	14 (12.61)	19 (23.75)	0.045	33 (17.28)
- LTRA (%)	25 (22.52)	31 (38.75)	0.015	56 (29.32)

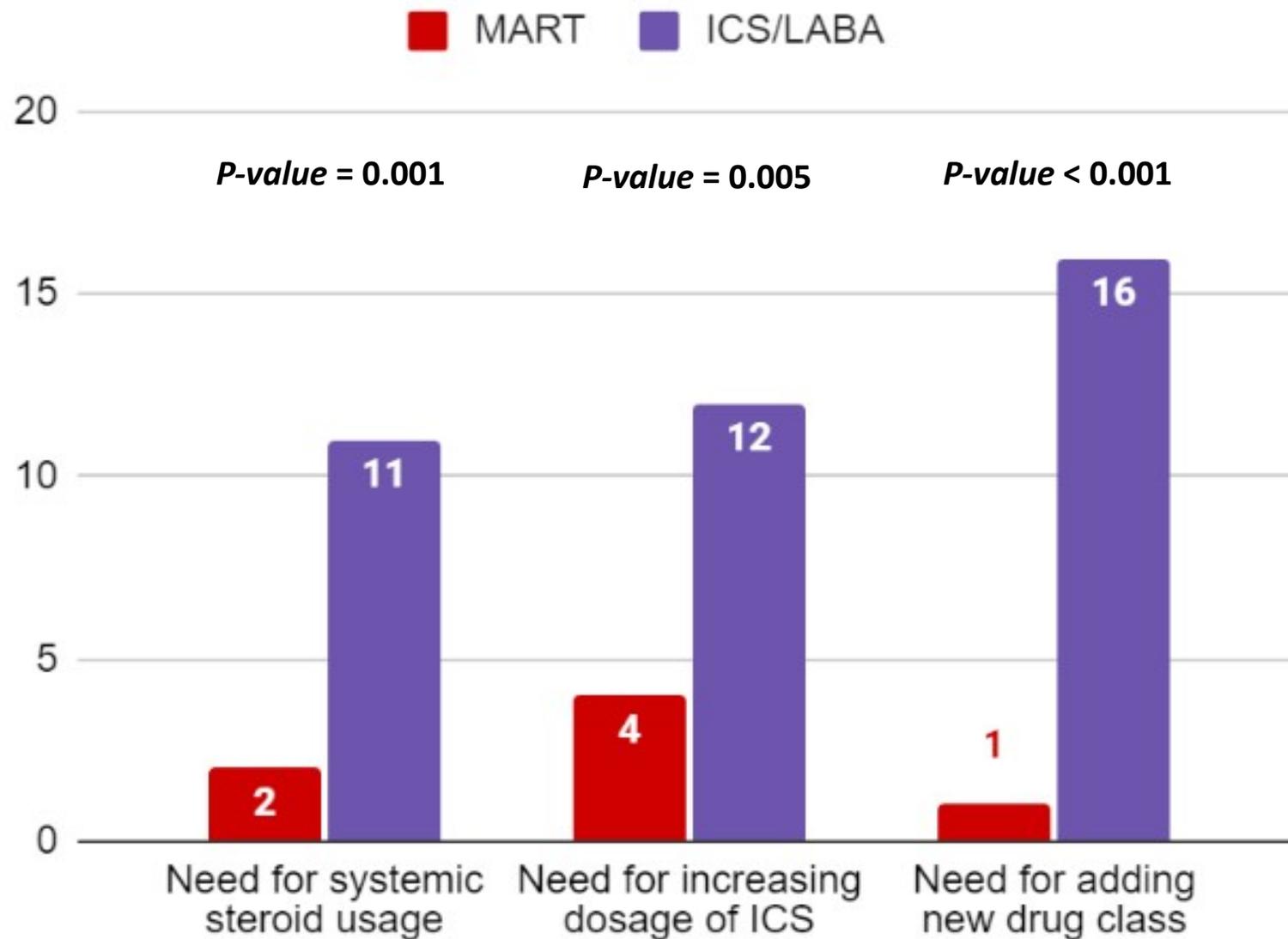
Percentage of patients between group of as



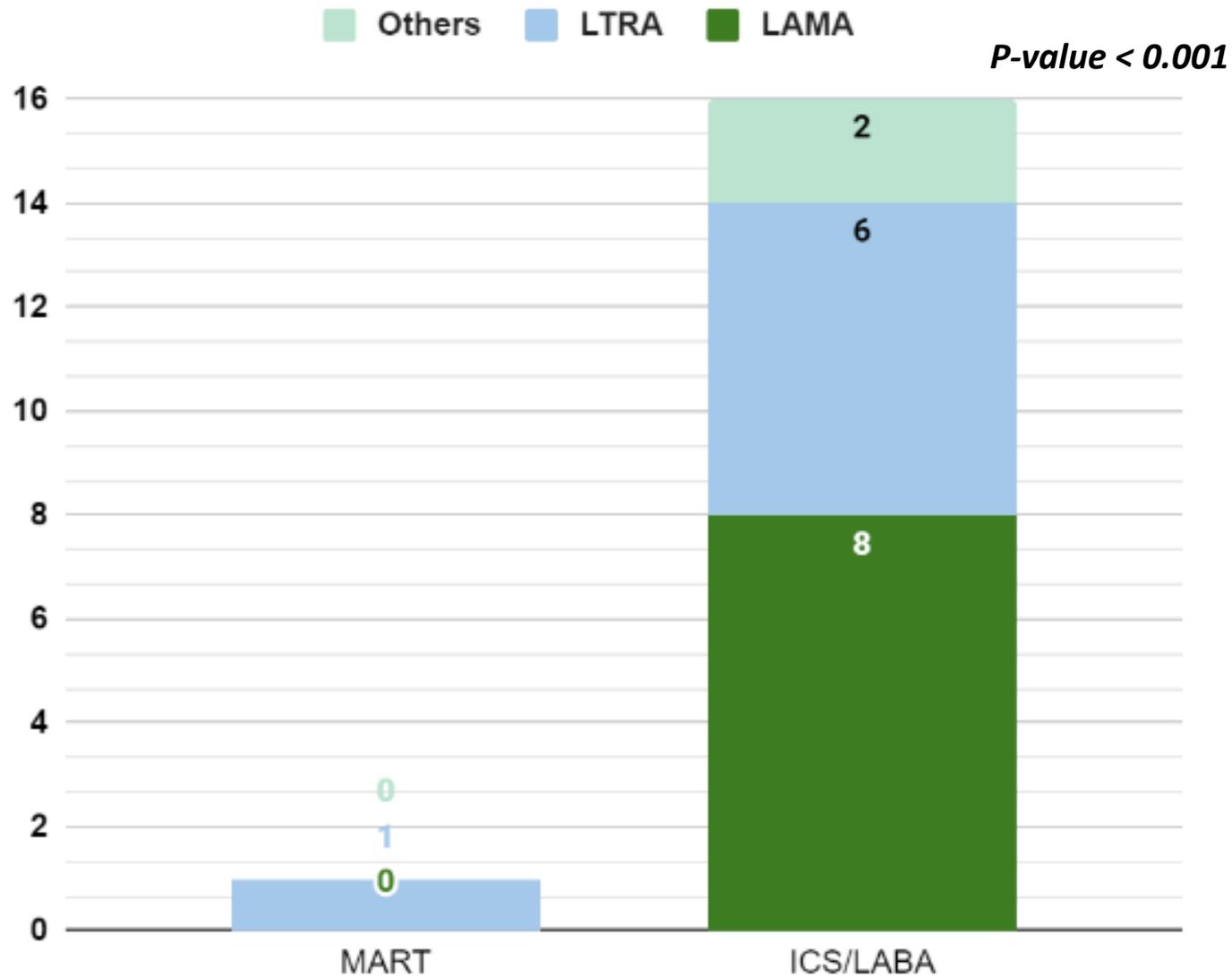
Percentage of completeness of inhaler techn



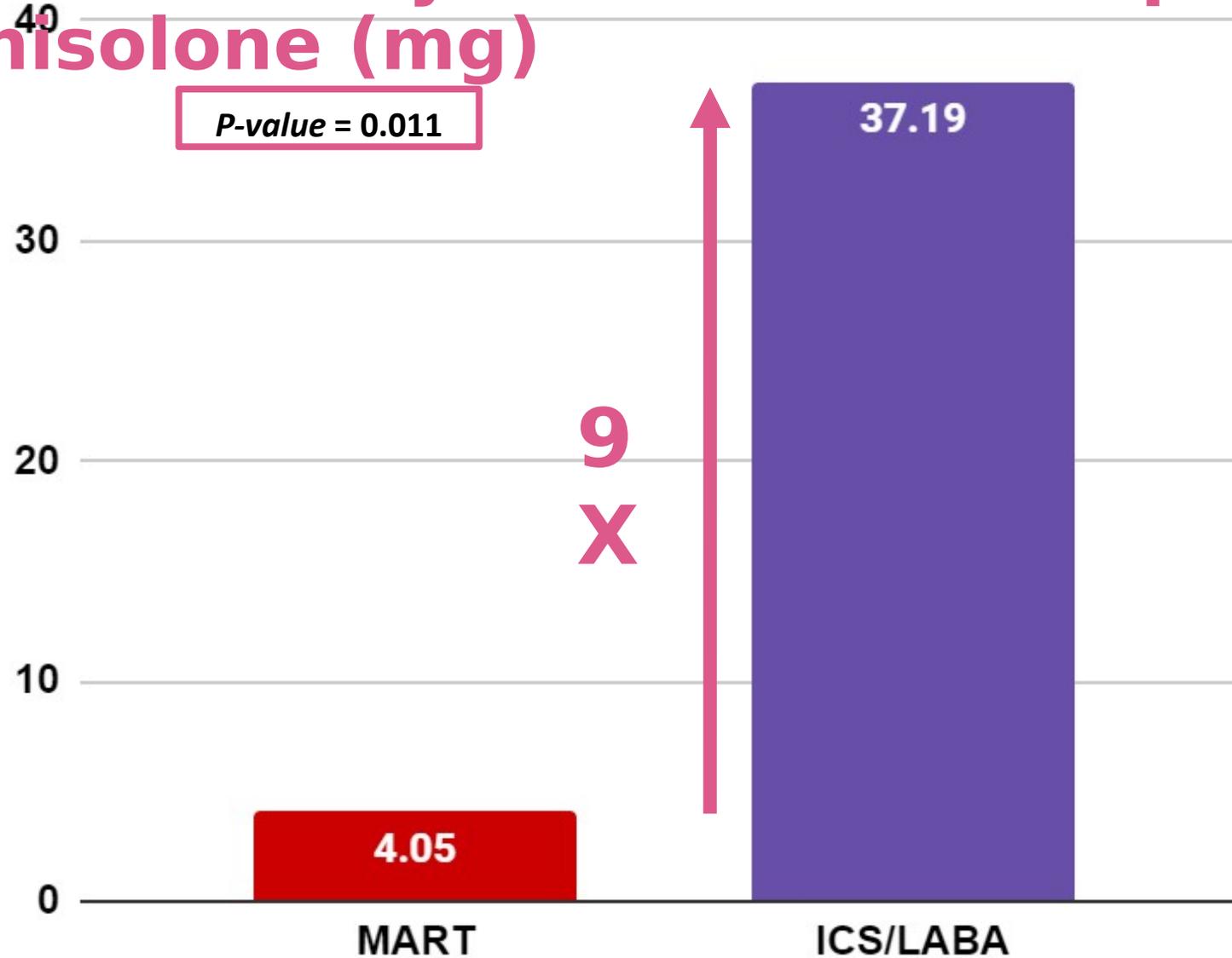
Number of patients need for adjust a treat



Number of patients needing for adding new drug cl



Average dose of systemic steroid equivalent to Prednisolone (mg)



Number of severe exacerbation patient in 6 months

MART



1

**ICS/
LABA**



2

P-value = 0.374

Discussion & Conclusion



Discussion

- There are many impacts on asthma control, and **pharmacist education** is one of the factors.
- All patients in this study are educated by a **Respiratory pharmacist**.
- This study found that MART had a better outcome than the ICS/LABA group in asthma control, need for systemic steroids, and new drug class.
- Consequently, an appropriate treatment regimen for the patient is another factor.

Limitations

- Single center study
- A prospective and Cross-sectional study causes a difference in the number of patients and baseline characteristics between 2 groups.
- This study includes patients only in the asthma clinic, Pulmonologist care.

Conclusion

- **MART regimen had a better outcome in**
 - **Higher number of patients with asthma control**
 - **Lower need and dosage for systemic steroid usage**
 - **Lower need for increasing dose of ICS**
 - **Lower need for adding new drug class**
- when compared with ICS/LABA in moderate to severe asthma patients**



**Maintenance And Reliever
Therapy (MART)
improves asthma control in**




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