The effect of Zingiber cassumunar (Phlai capsule) on bronchial hyperresponsiveness in asthmatic patients

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Introduction

Bronchial hyperresponsiveness (BHR) is a key feature of asthma. Compound D (active compound in Phlai) can bind cysteinyl leukotrienes receptors that play role for asthma treatment. This study aimed to determine the effect of Phlai capsules on BHR measured by methacholine challenge tests.

Methods

A randomized, double-blind, placebo-controlled, crossover study was performed between February 2019 - July 2019 at Thammasat University Hospital, Thailand. Asthmatic patients with partly controlled aged at least 18 years were enrolled. Each patient received 4 weeks of treatment with either Phlai or placebo separated by a 2-week washout period. Main outcome was changes in provocative concentration of methacholine causing a 20% drop in FEV1 (PC20). Fractional exhaled nitric oxide (FeNO), asthma control test (ACT) scores, FEV1, and FEF25-75% were secondary end points. Adverse events were recorded.

Figure 1. Study flow chart

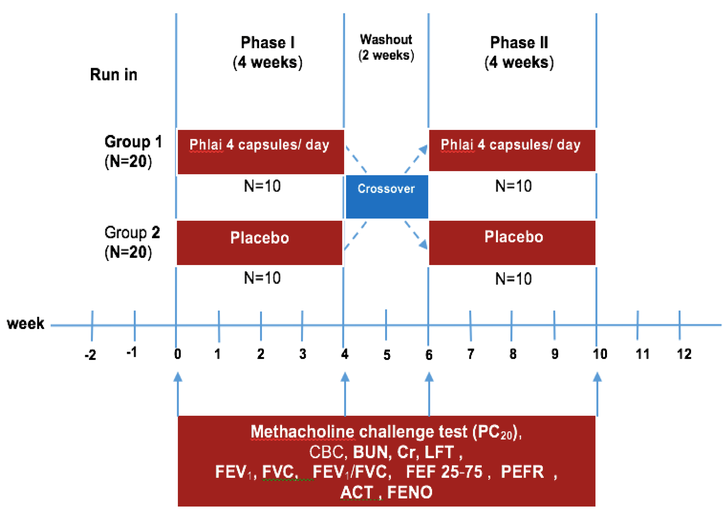

Table 1. Baseline characteristics

Characteristics		Total patients N = 20	Phlai capsules before N = 10	Placebo before N = 10
Age, years		40.7 ± 14.62	43.3 ± 18.33	38.1 ± 10.01
Sex	Male	6 (30%)	4	2
	Female	14 (70%)	6	8
Weight(kg)		65.65 ± 10.74	64.8 ± 13.61	66.5 ± 7.53
Height (cm)		162.8 ± 9.1	161± 9.82	164.6 ± 8.43
BMI		24.76 ± 3.32	24.94 ± 4.16	24.56 ± 2.42
History of smoking	No	15 (75%)	6	9
	Yes	4 (20%)	3	1
Symptom controlled	Partly controlled	20 (100%)	10	10
Comorbidities	Allergic rhinitis	20 (100%)	10	10
	Atopic dermatitis	1 (5%)	-	1
	Allergic conjuntivitis	3 (15%)	1	2
Medications	ICS/LABA	20 (100%)	10	10
	INS	18 (90%)	9	9
Eosinophil count (Cells/mm3)		260.61 ± 179.97	278.68 ± 196.13	242.55 ± 170.84
Baseline spirometry	FEV_1 (L)	2.32 ± 0.55	2.20 ± 0.56	2.42 ± 0.54
	FEV_1/FVC (%)	75.63 ± 7.57	73.46 ± 8.86	77.82 ± 5.65
	FEF 25-75 (% predicted)	59.6 ± 20.39	53.8 ± 19.6	65.4 ± 20.47
	PEFR (L/min)	396±84.18	382±96	411±72.64

Results

A total of 20 patients were randomly allocated to Phlai or placebo group. All patients had allergic rhinitis and 50% with previous history of taking leukotriene receptor antagonist and xanthines. Four weeks after treatment, PC_{20} in Phlai group (6.87 ± 7.23 mg/ml) was higher than placebo (2.75 ± 2.16 mg/ml), p= 0.24 (Figure 2) . There were no differences in FeNO, ACT scores, FEV_1 and $FEF_{25-75\%}$ between both groups (Table 2). All patients in Phlai group were well-tolerated and could reduce rhinitis medications without symptom exacerbation.

Figure 2 Comparison of PC_{20} between Phlai and placebo groups

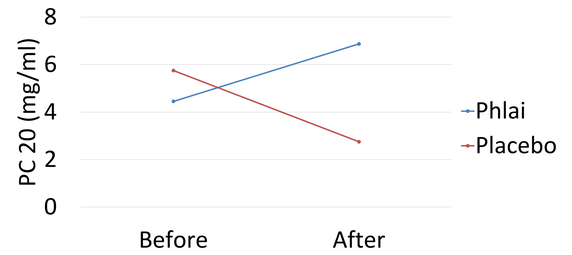

Table 2. Secondary outcomes and lung function after 4 weeks of Phlai and placebo groups

	Phlai (Mean ± SEM)			Placebo (Mean ± SEM)			Mean change ± SEM		
	Before	After	P-value	Before	After	P-value	Phlai	Placebo	P-value
FENO	37.8 ±9.68	37.8±9.86	1	37.4 ±7.19	40.1 ±9.86	0.523	0 ± 2.71	2.7 ± 4.15	0.562
ACT scores	21.3 ±0.38	21.4±0.41	0.776	20.95 ±0.4	22.15±0.37	0.005	0.1 ± 0.35	1.2 ± 0.38	0.063
PEF	400 ± 22.7	406 ±25.5	0.464	408 ±20.91	407 ± 23.27	0.924	6 ± 8.03	-1 ± 10.31	0.571
FEV1	2.32 ±0.12	2.32±0.13	0.898	2.33 ± 0.14	2.29 ± 0.13	0.095	0 ± 0.03	-0.04 ± 0.02	0.292
FEV1/FVC	75.74 ±1.85	75.4 ± 2.04	0.671	75.79±1.84	75.5 ± 1.79	0.673	-0.33±0.77	-0.29 ± 0.68	0.964
FEF 25-75%	59.8 ± 4.76	60.3 ± 4.92	0.794	60 ± 4.46	58.2 ± 4.55	0.237	0.5 ± 1.89	-1.8 ± 1.48	0.227
AEC	271.62±42.29	289.25±40.94	0.371	261.21 ± 36.66	290.96 ± 40.16	0.051	17.64 ±19.24	29.75 14.25	0.652

Conclusions

Phlai capsules had a trend to decrease BHR and add-on therapy of rhinitis mediations in partly controlled asthmatic patients. The main limitation was small sample size

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