Supplementary Materials

Table 1. Study quality assessment of risk of bias using Newcastle-Ottawa scale

Study year	Selection	Comparability	Outcome	Total score	AHRQ interpretation
Gao et al., 2015	2	0	3	5	Poor quality
Park et al., 2016	3	1	3	7	Good quality

Table 2. Study quality assessment of risk of bias using Revised Cochrane

	Risk of bias arising from the randomization process	Risk of bias due to deviations from the intended interventions	Missing outcome data	Risk of bias in measurement of the outcome	Risk of bias in selection of the reported result	Overall risk of bias
Kook et al., 2020	Low	Low	Low	Low	High	High
Higuma et al., 2010	Low	Some concerns	Low	Some concerns	Some concerns	Some concerns
Shin et al., 2014	Low	Low	Low	Low	High	High
Oikawa Y et al., 2009	Low	Some concerns	Low	High risk	Some concern	High

Table 3. Description of the studies in this systematic review

Author year	Country	Study design	Study population	Number of participants, age, gender	Study objective	Research instrument
Gao et al., 2015	China	Retrospective cohort study	Participants admitted to Suizhou Central Hospital	*N* = 5, age 45-62 (mean age: 50), 80% male	To determine the effect of diltiazem in treating atrioventricular block caused by coronary spasm	Holter ECG, coronary angiography, clinical symptoms
Kook et al., 2020	Korea	Prospective Randomized double-blind trial	Participants admitted to Korea University Anam Hospital, Guro Hospital, Ansan	*N* = 48, age 35-80 years, 66.67% male	To determine percent changes in coronary artery spasm, the quality of life, changes in blood pressure, and	Seattle Angina Questionnaire, electrocardiography, computerized quantitative analyzer (to measure the diameter of artery), enzyme-

			Hospital, and Severance hospital		inflammatory markers and lipid profiles	linked immunosorbent assay (ELISA)
Park et al., 2016	Korea	Observational retrospective study (non randomized)	Participants admitted to Cardiovascular Center of Korea University Guro Hospital, Seoul, South Korea with typical and atypical chest pain	*N* = 2741, divided to 2 groups, Diltiazem only group 842, and dual group Diltiazem and nitrate 1899. All the study participant were male	To observe the cumulative clinical end point (mortality, PCI, MI, cerebrovascular accident, repeat CAG, and MACE, within 5 years.	Quantitative coronary angiography (QCA), acetylcholine provocation test
Higuma et al., 2010	Japan	Randomized control trial (RCT)	37 patients with VSA from 8 institutions in Aomori	37 subjects were randomly assigned to Nifedipine	The effectiveness of nifedipine compared to twice daily	24 hours ambulatory ECG, blood pressure and heart rate assessment,

			Prefecture between January 2007 and December 2008.	group N=20 (60% male) and Diltiazem N=17 (47.1% male)	diltiazem in VSA attack.	statistical analysis, acetylcholine test during arteriography.
Shin et al., 2014	Korea	Randomized control trial	Subjects were recruited from 10 teaching hospitals in South Korea. All subjects were newly diagnosed with VSA within 3 months.	71 patients from 10 hospitals were screened, 50 patients met the study criteria were randomly to receive the drugs. Both male and female	To assess the effectiveness and side effects of amlodipine compared to cilostazol therapy in uncontrolled VSA.	Ergonovine induced coronary artery spasm angiography, 12 lead ECG

				were equally distributed in the amlodipine group.		
Oikawa Yet al., 2009	Japan	Randomized non-blinded trial	Outpatient patients registered in three facilities specializing in cardiovascular medicine in Tokyo from January 2007 to December 2008	N= 28, (30, but 2 dropped out because of increasing attacks and hypotension) ; 4 more patients dropped out because of insufficient	To compare nifedipine and benidipine effectiveness in reducing frequency of angina attacks and nitrates usages.	Holter ECG, coronary angiography (intracoronary injection of acetylcholine or ergonovine), symptom diaries

				efficacy of the medication, mean age 64.6, 9 male/5 female		

Table 4. Comparison of Various Calcium Antagonist on Vasospastic Angina

Author	Types of CCB evaluated	Frequency of symptomatic episodes	adverse effects and other results	Percentage change of artery diameter
Gao et al., 2015	Diltiazem	After followed up for a period ranging from 1 month to 2 years, none reported recurrence of chest pain, chest tightness, hypotension, or adverse drug reactions.	NR	NR
Kook et al., 2020	Diltiazem	Significant improvement of quality of life based on Seattle Angina Questionnaire from baseline to 12-weeks after treatments across three groups with changes 5.2 $\pm$ 8.5 ($p=0.0002$). However, no significant difference between baseline and each group. Significant	No significant differences in inflammatory cytokine levels from baseline during the 12 weeks across three groups ($p>0.05$)	Greatest in Diltiazem group. Percent changes in diameter from the baseline provocation test for Diltiazem

		improvement of systolic blood pressure reduction from baseline after 12-weeks treatments across three groups (p<0.0001).		group is 67.8%±12.8%
Park et al., 2016	Diltiazem (n=811)	Angiographic chest pain characteristic post PSM 521(64.2) (p=0.354) Recurrent angina up to 5 years 8.3 post PSM (p=0.276)	Incidence of AV block 276 (34.0) (p<0.001) 5 years total death 0.0 (p<0.05)	Quantitative coronary angiography: diameter of narrowing post PSM 70.4±12.5 (p=0.144) Diffuse spasm in coronary angiography (narrowing >30mm) post PSM 697 (85.9) (p=0.943)

Higuma et al., 2010	Nifedipine CR 1x40mg	Frequency of angina baseline value per week 2.56±3.16 (p=0.671) Frequency was reduced significantly to 0.41, 0.24, 0.36 by the 4th, 8th and 12th weeks consecutively (p<0.05 vs baseline)	Five-point scale efficacy showed slight improvement in both groups without significant difference The heart rate was found to be significantly increased in the 8th week of treatment by 7.2±8.9 beats/min 2 patients had their treatment switched to diltiazem due to palpitation in 4 days and 4 weeks There were no ECG changes after 12 weeks treatment in all patients	NR
	Diltiazem R 2x100mg	Frequency of angina baseline value per week 2.71±2.57 (p=0.671)	One patient switched to Nifedipine due to the recurrence of angina episode within 4 weeks.	NR

		Frequency was reduced significantly to 0.55, 0.32, 0.27 by the 4th 8th and 12th weeks consecutively ($p<0.05$ vs. baseline) No significant difference in between the two drug groups	Another patient experienced recurrence at 8 weeks but resolved with additional Nicorandil drug. In one patient asymptomatic advanced atrioventricular block was detected and switched to nifedipine CR.	
Shin et al., 2014	Amlodipine 5mg/day	Baseline: ≥1 angina episodes/week Change in the frequency of weekly chest pain -17.6%±140.1 (-1.9x ± 0.6) Change in the total pain intensity -7.5±2.7 Change in the average pain intensity -1.1±0.4	Change in glyceryl trinitrate consumption -0.4±0.6 Headache was the most common adverse events (20%), followed by dizziness (8.3%), palpitation (8.3%), bradycardia (4.2%), chest discomfort (4.2%), GI symptoms (4.2%)	Baseline value: ergonovine induced coronary artery spasm produce >90% narrowing of the artery diameter in angiography,

		Proportion of chest pain free 33.3%	One subject had <80% drug adherence	accompanied with ST elevation or depression ≥0.1mV found from at least 2 leads. Insignificant diameter stenosis <50% after injection of nitroglycerine
Oikawa Y, et al. 2009	Nifedipine CR 40mg n=15	Frequency of symptomatic episodes improved by 0.10 ± 0.40 per week in the 8th week (p = 0.0002)	Adverse effects found in 1 patient given nifedipine whom experienced excessive drop in blood pressure after the administration	NR

			of the drug. Other results observed by the attending physicians found that 100% of the study participants with Nifedipine CR 40mg were found to have improved subjective symptoms and objective signs	

NR: not reported