High-Risk Vascular Disease in Japan: Evidence on Incidence and Prevalence, Patient Characteristics, and Treatment Rates From a Large Japanese Claims Database

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BACKGROUND

- Among the various forms of vascular disease, acute coronary syndrome (ACS), cerebrovascular disease (CVD) with or without ischemic stroke, peripheral arterial disease (PAD), and coronary artery disease with comorbid diabetes (CADD) present a particularly high risk of ischemic events, limb damage, and other adverse outcomes.
- High-risk vascular disease (HRVD), including history of ACS (hACS), PAD, CVD, and CADD, accounts for approximately half of morbidity and mortality in the adult population aged 50 years and older.[1]
- Limited published data exist from Japanese populations on the current incidence and prevalence of HRVD and its associated patient characteristics and overall treatment rates.

OBJECTIVE

- To document the incidence/prevalence, patient characteristics, and treatments of HRVD in an employed Japanese population.

METHODS

- A retrospective analysis was conducted using the Japan Medical Data Center (JMDC) database.
  - The database includes inpatient, outpatient, and pharmacy claims for 831,182 lives from 2006 to 2011, representing approximately 1% of the total Japanese population.
- HRVD incidence/prevalence was estimated based on International Classification of Disease, 10th Revision (ICD-10) diagnoses for hACS, CVD, PAD, and CADD occurring 1/1/2008–12/31/2009.
  - Population denominators for this period were provided by JMDC.
  - hACS was defined as an ACS claim > 30 days but ≤ 365 days after a prior ACS-related hospitalization and therefore represented incident cases.
  - Diagnoses for CVD, PAD, and CADD do not necessarily represent acute events, and given the relatively limited history available on patients (i.e., no data prior to database entry) and the chronic nature of these conditions, patients with these conditions likely represent prevalent cases.
- A subcohort with insurance coverage for ≥ 12 months before and ≥ 24 months after first (index) HRVD claim during 1/1/2008–12/31/2009 were analyzed on demographics, comorbidities, and treatments.
  - This subcohort was grouped into mutually exclusive categories based on index HRVD type observed during the study entry period of 1/1/2008–12/31/2009.
  - Patient demographics were measured at the HRVD index claim.
  - Comorbidities and prior treatment history were assessed over 12 months preindex.
  - Postindex treatments were assessed over 24 months after the index HRVD claim.

RESULTS

HRVD Incidence/Prevalence

- Overall HRVD incidence/prevalence was 2,238 per 100,000 population (Figure 1a).
- By subtype (nonmutually exclusive, regardless of age), hACS incidence was 73 per 100,000, while prevalence of CVD, PAD, and CADD was 1,289, 897, and 591 per 100,000 population, respectively (Figure 1a).
- Incidence/prevalence of all HRVD subtypes increased exponentially with age (Figure 1a).
- Regardless of age, overall HRVD incidence/prevalence was higher in males (Figure 1b).

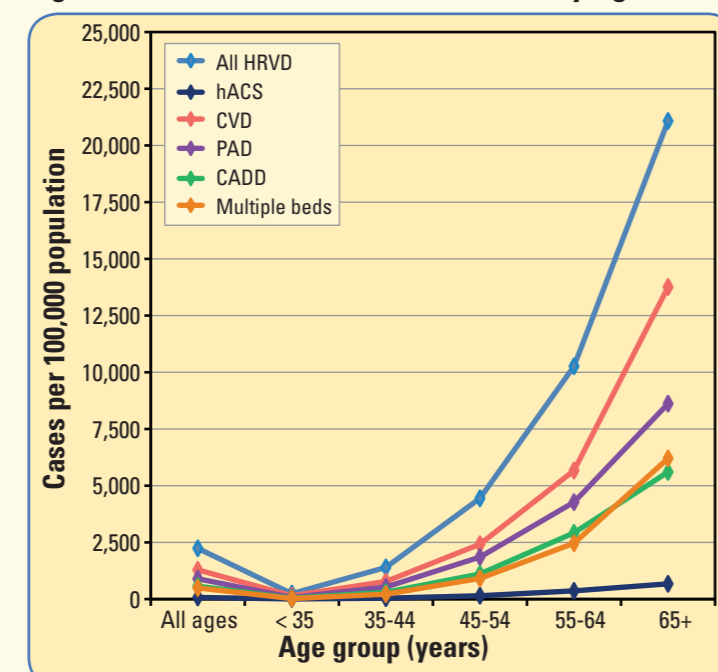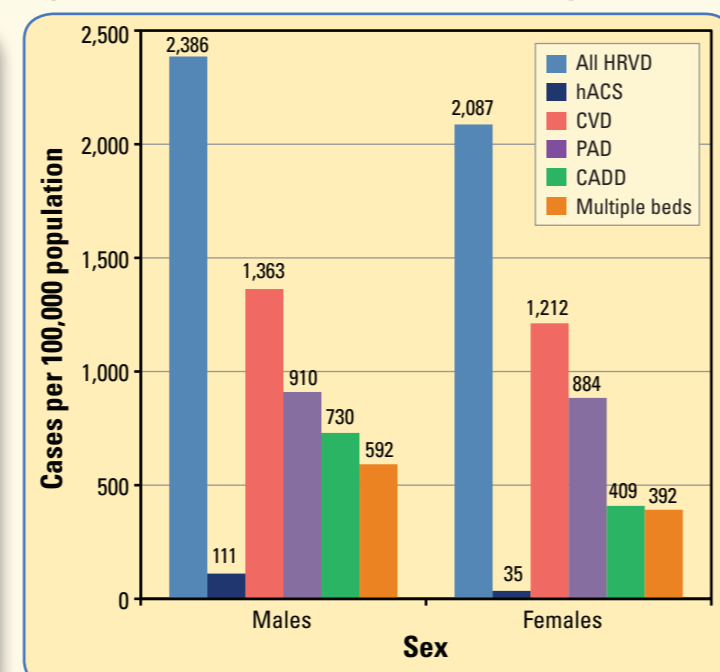### Figure 1a. HRVD Incidence/Prevalence, by Age

Figure 1b. HRVD Incidence/Prevalence, by Sex

HRVD = high-risk vascular disease, hACS = history of acute coronary syndrome, CVD = cerebrovascular disease, PAD = peripheral arterial disease, CADD = coronary artery disease with diabetes.

Patient Characteristics and Comorbidities

- In total, 10,400 patients met the inclusion criteria for analyses of patient characteristics, comorbidities, and treatments.
- Mean (standard deviation [SD]) age at index was 52.8 (10.9) years, and 57% of included patients were male (Table 1).
- Hypertension was particularly common among patients with hACS-only and hACS + CADD (approximately 63% of both groups).
- Overall comorbidity burden, as measured by the Charlson Comorbidity Index (CCI),5 was highest for patients with hACS-only and hACS + CADD.

Treatment Rates

- Among all patients with HRVD, preindex use of antihypertensives and lipid-altering drugs was 22% and 15%, respectively (Figure 2a).
  - Antihypertensive use during the preindex period was highest in patients with hACS + CADD (75%) and hACS-only (67%).
- Among all patients with HRVD, during 24 months postindex, use of antihypertensives and lipid-altering drugs increased to 53% and 42%, respectively (Figure 2b).

Figure 2. Preindex (a) and Postindex (b) Treatment Utilization
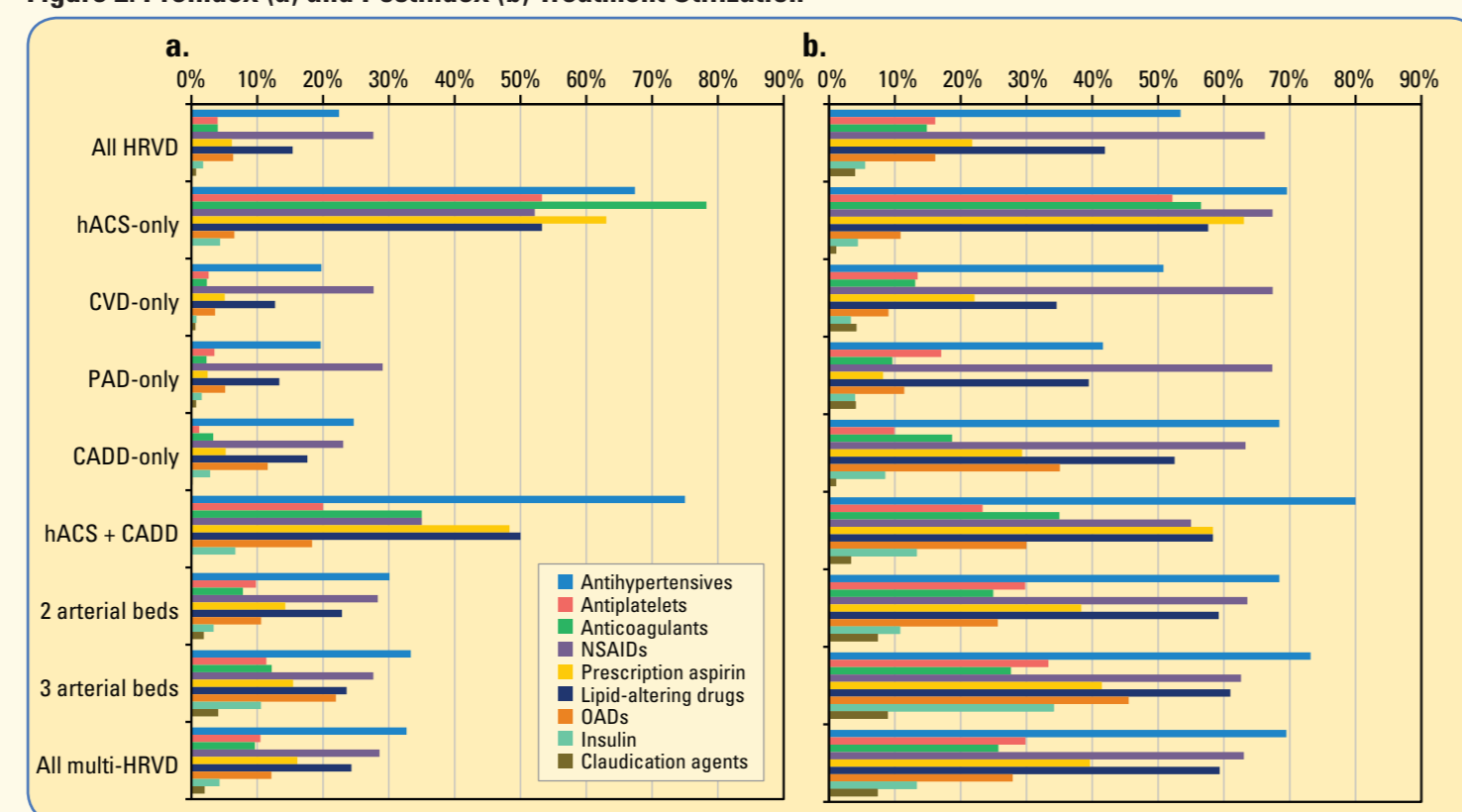
Treatment Duration and Persistence

- Among all patients with HRVD using an antihypertensive medication, mean (SD) duration of treatment over the postindex period was 529 (229) days, which translated to a days' supply coverage of 72% of the 24-month follow-up period (Table 2).
- Among all patients with HRVD treated with a lipid-altering drug in the postindex period, mean (SD) duration of treatment was 474 (238) days (or 65% of follow-up).

Table 1. Patient Characteristics and Comorbidities

Characteristic	All HRVD Patients (N = 10,400)		HRVD Subtype at Index							
			hACS-Only (n = 92)	CVD-Only (n = 4,492)	PAD-Only (n = 2,930)	CADD-Only (n = 1,693)	Multi-HRVD			
							hACS + CADD (n = 60)	2 Arterial Beds (n = 1,010)[a]	3 Arterial Beds (n = 123)[b]	Any Multi-HRVD (N = 1,193)
Age at index										
Mean (SD)	52.8	(10.9)	50.1 (10.6)	52.3 (11.4)	52.7 (10.5)	53.0 (10.1)	53.6 (7.8)	55.1 (10.2)	55.6 (11.2)	55.0 (10.2)
Sex (%)										
Male	57.1		83.7	55.0	49.2	68.3	90.0	64.1	69.9	66.0
Cardiovascular-related comorbidities during 12-month preindex period (%)										
Hypertension	23.6		63.0	20.9	21.1	25.7	63.3	32.4	35.0	34.2
Dyslipidemia	17.1		43.5	14.7	15.3	20.0	45.0	23.8	23.6	24.8
Renal impairment	1.4		1.1	0.9	1.6	1.2	8.3	3.0	3.3	3.3
Myopathy	0.1		1.1	0.0	0.0	0.0	0.0	0.2	0.0	0.2
Diabetes	20.7		46.7	13.2	14.7	100.0	100.0	32.2	45.5	36.4
Mean (SD) CCI	1.0	(1.6)	3.2 (2.1)	0.9 (1.5)	0.8 (1.4)	1.2 (1.7)	3.5 (1.9)	1.6 (2.1)	2.0 (2.4)	1.7 (2.2)

[a] Includes 417 patients with CVD + PAD, 243 patients with CVD + CADD, 211 patients with PAD + CADD, 66 patients with hACS + CVD, 39 patients with hACS + PAD, 18 patients with hACS + PAD + CADD, and 16 patients with hACS + CVD + CADD.
[b] Includes 105 patients with CVD + PAD + CADD, 9 patients with hACS + CVD + PAD, and 9 patients with ACS + CVD + PAD + CADD.
CCI = Charlson comorbidity index.

Table 2. Duration and Persistence of Selected HRVD-Related Drug Utilization During the Postindex Period, Among Patients With Use of Treatment

Treatment	All HRVD Patients (N = 10,400)		HRVD Subtype at Index							
			hACS-Only (n = 92)	CVD-Only (n = 4,492)	PAD-Only (n = 2,930)	CADD-Only (n = 1,693)	Multi-HRVD			
							hACS + CADD (n = 60)	2 Arterial Beds (n = 1,010)[a]	3 Arterial Beds (n = 123)[b]	Any Multi-HRVD (N = 1,193)
Antihypertensives										
Mean (SD) days of treatment	529.1	(229.5)	565.8 (220.3)	514.0 (239.5)	516.4 (232.9)	554.6 (211.4)	568.7 (186.2)	549.8 (217.7)	547.2 (224.7)	550.6 (216.6)
% of follow-up with drug coverage/supply	72.5		77.5	70.4	70.7	76.0	77.9	75.3	75.0	75.4
Antiplatelets										
Mean (SD) days of treatment	372.2	(274.9)	379.5 (273.4)	387.1 (277.1)	294.4 (265.9)	354.4 (260.5)	417.7 (244.4)	465.2 (257.6)	462.9 (288.0)	463.1 (260.2)
% of follow-up with drug coverage/supply	51.0		52.0	53.0	40.3	48.5	57.2	63.7	63.4	63.4
Anticoagulants										
Mean (SD) days of treatment	144.5	(255.4)	82.3 (208.5)	145.0 (253.1)	122.4 (235.5)	162.2 (270.4)	232.7 (317.1)	154.1 (264.9)	122.4 (244.0)	155.9 (266.6)
% of follow-up with drug coverage/supply	19.8		11.3	19.9	16.8	22.2	31.9	21.1	16.8	21.4
NSAIDs										
Mean (SD) days of treatment	53.7	(116.0)	53.0 (122.4)	48.9 (104.0)	56.6 (121.5)	62.7 (134.5)	23.5 (24.8)	53.1 (118.2)	63.6 (134.4)	52.9 (117.6)
% of follow-up with drug coverage/supply	7.4		7.3	6.7	7.8	8.6	3.2	7.3	8.7	7.2
Prescription aspirin										
Mean (SD) days of treatment	493.6	(249.6)	592.0 (179.8)	464.0 (260.1)	411.3 (279.5)	523.1 (230.6)	564.2 (224.2)	556.0 (208.9)	534.6 (246.7)	554.3 (214.0)
% of follow-up with drug coverage/supply	67.6		81.1	63.6	56.3	71.7	77.3	76.2	73.2	75.9
Lipid-altering drugs										
Mean (SD) days of treatment	474.3	(237.9)	557.7 (206.7)	458.2 (242.4)	423.8 (250.8)	523.1 (210.3)	571.9 (182.3)	524.5 (217.0)	498.2 (241.3)	524.0 (218.3)
% of follow-up with drug coverage/supply	65.0		76.4	62.8	58.1	71.7	78.3	71.8	68.2	71.8
OADs										
Mean (SD) days of treatment	533.2	(206.5)	479.5 (231.3)	529.3 (202.3)	509.6 (221.8)	541.0 (199.0)	534.9 (239.0)	552.8 (199.0)	535.8 (234.1)	549.0 (207.0)
% of follow-up with drug coverage/supply	73.0		65.7	72.5	69.8	74.1	73.3	75.7	73.4	75.2
Insulin										
Mean (SD) days of treatment	33.3	(42.1)	182.3 (352.5)	27.0 (34.2)	31.2 (25.8)	34.1 (23.9)	22.0 (18.1)	35.8 (33.6)	40.5 (45.1)	36.3 (36.5)
% of follow-up with drug coverage/supply	4.6		25.0	3.7	4.3	4.7	3.0	4.9	5.5	5.0
Claudication agents										
Mean (SD) days of treatment	382.7	(274.2)	623.0	—c	386.9 (270.3)	350.4 (283.3)	312.3 (246.4)	252.0 (295.6)	430.2 (266.1)	453.1 (319.3)	429.0 (271.6)
% of follow-up with drug coverage/supply	52.4		85.3	53.0	48.0	42.8	34.5	58.9	62.1	58.8

[a] Includes 417 patients with CVD + PAD, 243 patients with CVD + CADD, 211 patients with PAD + CADD, 66 patients with hACS + CVD, 39 patients with hACS + PAD, 18 patients with hACS + PAD + CADD, and 16 patients with hACS + CVD + CADD.
[b] Includes 105 patients with CVD + PAD + CADD, 9 patients with hACS + CVD + PAD, and 9 patients with hACS + CVD + PAD + CADD.
[c] Standard deviation not calculable (cell n = 1).

LIMITATIONS

- Study data were taken from an employed, primarily working-age population and may therefore represent a younger age distribution than the general HRVD population of Japan.
- Patients were identified for study inclusion on the basis of ICD-10 diagnosis codes recorded on billing claims, which (as with all claims-based studies) are subject to coding errors.
- Survival data were not available. Therefore, our incidence/prevalence estimates (particularly for hACS) could not be separated by fatal versus nonfatal events.

CONCLUSIONS AND DISCUSSION

- HRVD was not rare in the employed Japanese population analyzed, and a high proportion of cases involved multiple HRVDs.
- Our estimates of overall hACS incidence were 111 per 100,000 males and 35 per 100,000 females; these estimates are within range of several small and large population-based studies of ACS incidence in Japan.[6-8] Limited published data from other studies were available on CVD, PAD, and CADD prevalence to compare with our findings.
- Pharmacotherapy rates after HRVD diagnosis were low, particularly for non-hACS patients, as compared with rates observed in Western countries.

REFERENCES

Please see handout.

CONTACT INFORMATION

FUNDING