

# Comorbidities in aging persons with hemophilia A (PwHA)

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## INTRODUCTION

- Improvements in hemophilia A (HA) management have resulted in increased life expectancy of persons with hemophilia A (PwHA), making it important to understand the comorbidity profile of PwHA as they age.
- There is conflicting evidence on the risk of various comorbidities, particularly cardiovascular (CVS) conditions, in PwHA compared with the general population.
- This study examined the prevalence of comorbidities in aging PwHA in the US, compared with those without HA.

## METHODS

- Data:** Retrospective, cross-sectional analysis using the US MarketScan<sup>®</sup> Medicare Supplemental Database, from 1/1/2006 to 9/30/2015 (study period).
- Sample:** Males aged  $\geq 65$  years with  $\geq 1$  year of continuous insurance plan enrollment after the index date.
  - PwHA** were required to have  $\geq 2$  HA diagnoses within a year (the first HA diagnosis assigned as the index date).
  - General population or controls** were required to have no diagnosis of any blood disorder (index date was randomly assigned in insurance enrollment period).
  - PwHA and controls** were **exact matched 1:5** on age, insurance type, region, and index year.
- Variables:** Comorbidities were identified as  $\geq 1$  ICD-9-CM diagnosis codes during one year of post-index period.
- Analysis:** Comorbidities were described and compared between PwHA and matched controls by age group (65–74 and  $\geq 75$  years) using Chi-squared test.

## RESULTS

- A total of 374 PwHA and 1870 matched controls were identified (**Table 1**).
- The prevalence of various comorbidities was significantly higher in PwHA compared with the control cohort, and increased with age (**Table 2**).
- CVS disease was the most prevalent comorbidity in PwHA (**Table 2**; **Figure 1**).
- Osteoarthritis was the most common joint-related comorbidity (**Figure 2**).

## CONCLUSIONS

- Older adults with hemophilia A have a high prevalence of aging-related comorbidities compared with those without hemophilia A.**
- The majority had evidence of cardiovascular disease.**
- Disease management should include a comprehensive assessment of health status to best support care.**

**Table 1. Baseline characteristics after matching**

	Controls N=1870	PwHA N=374
<b>Age in years, mean (SD)</b>	<b>76.6 (6.7)</b>	<b>76.6 (6.7)</b>
<b>US region, n (%)<sup>*</sup></b>		
Northeast	450 (24.1)	90 (24.1)
North central	610 (32.6)	122 (32.6)
South	520 (27.8)	104 (27.8)
West	275 (14.7)	55 (14.7)
<b>Insurance plan type, n (%)</b>		
Comprehensive	845 (45.2)	169 (45.2)
PPO	635 (34.0)	127 (34.0)
HMO	325 (17.4)	65 (17.4)
Other <sup>†</sup>	65 (3.5)	13 (3.5)

<sup>\*</sup>Unknown not shown here due to small numbers. <sup>†</sup>Include, consumer direct healthcare plan, point-of-service plan, others. HMO, Health Maintenance Organization; PPO, Preferred Provider Organization; SD, standard deviation

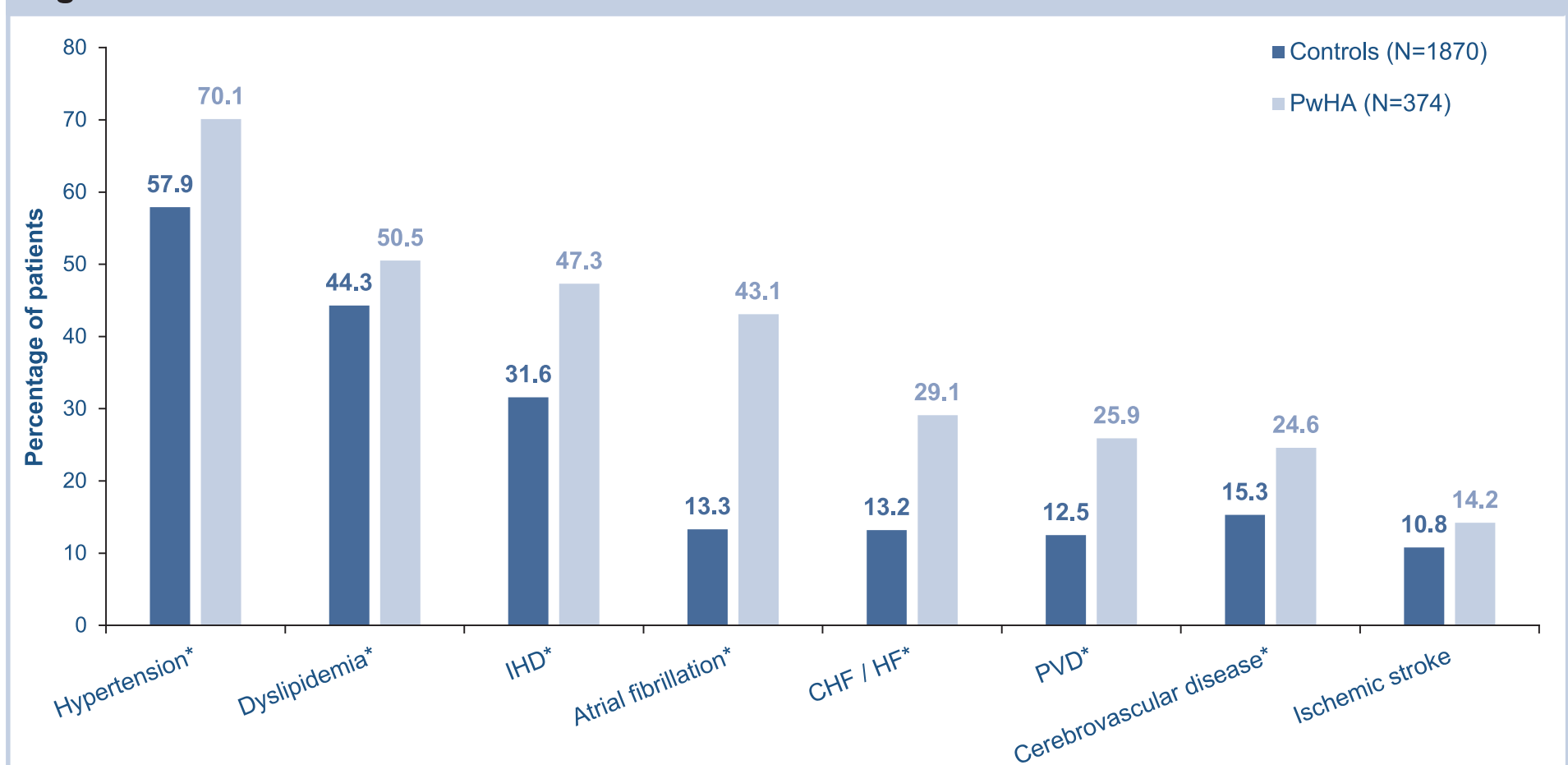
**Table 2. Prevalence of comorbidities in HA and general population cohorts**

Comorbidities, n (%)	65–74 years		$\geq 75$ years		All	
	Controls N=820	PwHA N=164	Controls N=1050	PwHA N=210	Controls N=1870	PwHA N=374
<b>CVS<sup>††</sup></b>	633 (77.2)	144 (87.8)	875 (83.3)	197 (93.8)	1508 (80.6)	341 (91.2)
<b>Anemia<sup>*</sup></b>	82 (10.0)	56 (34.2)	184 (17.5)	108 (51.4)	266 (14.2)	164 (43.9)
<b>Diabetes<sup>*</sup></b>	239 (29.2)	56 (34.2)	281 (26.8)	80 (38.1)	520 (27.8)	136 (36.4)
<b>Pain<sup>††</sup></b>	150 (18.3)	47 (28.7)	225 (21.4)	28 (27.6)	375 (20.1)	105 (28.1)
<b>Chronic pulmonary disease<sup>*</sup></b>	128 (15.6)	42 (25.6)	214 (20.4)	61 (29.1)	342 (18.3)	103 (27.5)
<b>Joint or MSK<sup>††</sup></b>	235 (28.7)	73 (44.5)	408 (38.9)	95 (45.2)	643 (34.4)	168 (44.9)
<b>Chronic renal or liver disease<sup>*</sup></b>	46 (5.6)	26 (15.9)	133 (12.7)	56 (26.7)	179 (9.6)	82 (21.9)
<b>Cancer<sup>*</sup></b>	122 (14.9)	34 (20.7)	220 (21.0)	59 (28.1)	342 (18.3)	93 (24.9)
<b>Mental health<sup>††</sup></b>	54 (6.6)	17 (10.4)	114 (10.9)	30 (14.3)	168 (9.0)	47 (12.6)
<b>Blood-borne infections<sup>††</sup></b>	4 (0.5)	15 (9.2)	7 (0.7)	7 (3.3)	11 (0.6)	22 (5.9)
<b>Others<sup>††</sup></b>	109 (13.3)	36 (22.0)	157 (15.0)	51 (24.3)	266 (14.2)	87 (23.3)

<sup>\*</sup>p<0.05 between all PwHA and control groups.

<sup>††</sup>Breakdown of grouped categories: CVS (myocardial infarction, angina pectoris, heart failure, ischemic heart disease, atrial fibrillation, dyslipidemia, hypertension, peripheral vascular disease, cerebrovascular disease, paraplegia and hemiplegia, thrombotic microangiopathy, arterial or pulmonary embolism, thrombosis, stroke, others); Blood infections (hepatitis, HIV/AIDS); Pain (chronic or joint pain); Joint or MSK conditions (osteoarthritis, arthropathy, rheumatoid arthritis, osteoporosis, osteopenia); Mental health (depression, anxiety, others); Any cancer and Others (overweight/obesity, Parkinson's disease, epilepsy, sexual dysfunction, thyroid disorder). CVS, cardiovascular; MSK, musculoskeletal.

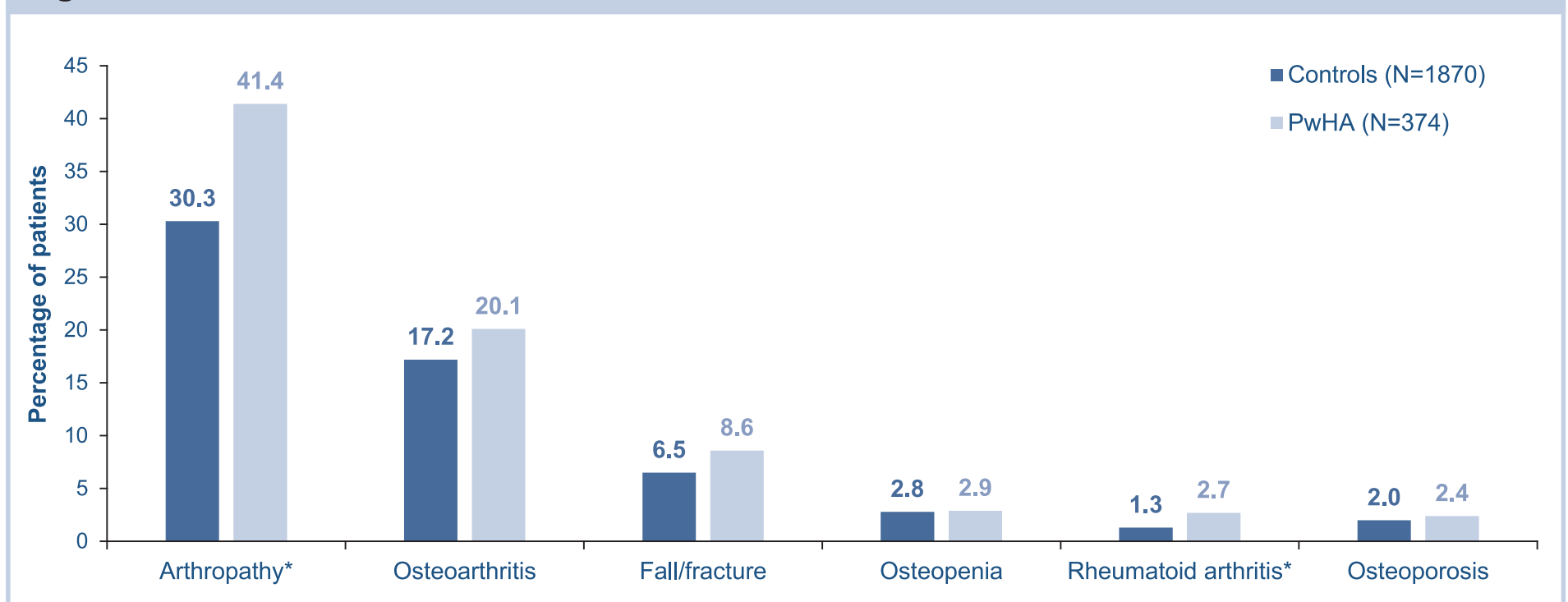
**Figure 1. Common cardiovascular comorbidities**



CHF, congestive heart failure; HF, heart failure; IHD, ischemic heart disease; PVD, peripheral vascular disease.

<sup>\*</sup>p<0.05 between all PwHA and control groups.

**Figure 2. Joint-related comorbidities**



<sup>\*</sup>p<0.05 between all PwHA and control groups.

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