

# Epidemiology of Fractures in patients with haemophilia



Authors: Caviglia, H<sup>1,2</sup>, Galatro, G<sup>1,2</sup>, Daffunchio, C<sup>1,2</sup>, Moretti, N<sup>1</sup>, Neme, D<sup>1</sup>, Douglas Price, AL<sup>2</sup>, Landro, ME<sup>2</sup>

1. Fundación de la Hemofilia, Buenos Aires, Argentina

2. Hospital General de Agudos Juan A. Fernández, Buenos Aires, Argentina

**Introduction:** Before the advent of factor concentrates, the expected median survival in a person with severe haemophilia was close to around 30 years.<sup>1</sup> Historically the daily activities in PWH were reduced due the changes produced in the musculoskeletal system associated with arthropathy and contractures. Musculature hypotrophy, osteoporosis, joint stiffness and malalignment, may predisposes them to risk of fracture.<sup>2</sup> With the advent of prophylaxis in the early 2000's in Argentina, a new era could focus on effective replacement therapy. There is very little information on the magnitude about fractures in PWH. The management of fractures in PWH has changed with the advance on replacement therapy, making the surgery treatment possible<sup>3, 4</sup>.

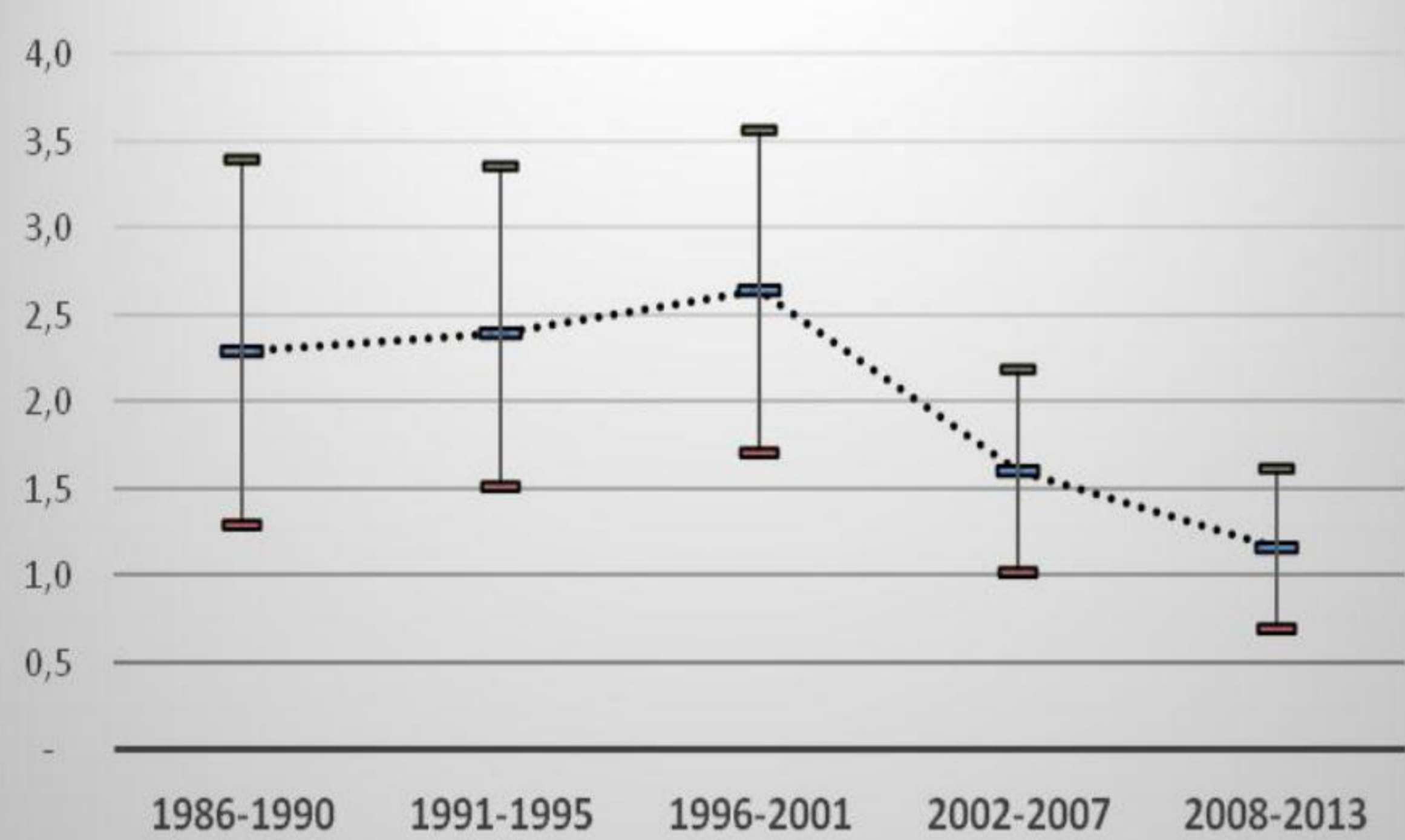
**Objective:** The purpose of this paper is to present our experience of one single center dedicate to the treatment of PWH, in the past 27 years, treating patients who suffered fractures, and analyzed the epidemiology of our results.

**Methods:** In this work we present the experience of Buenos Aires Hemophilia Center in the last 27 years. The population of PWH that attending our center was increasing over de years. In the period 1986-2013 we treated 151 fractures in 141 patients with hemophilia, 125 patients type A (88.7%), 12 type B (8.5%) and 4 (2.8%) with von Willebrand disease. For the analysis we divide the fractures in 5 groups according to the period which the fracture occurred: 1986-1990: 25, 1991-1995: 35, 1996-2001: 33, 2002-2007: 31, and 2008-2013: 27 and classified the fractures in lower limb (LL) and upper limb (UL). Also we analyzed the age at which fractures occurred of all the patients and in each group. The total mean age was 32 years old, ranging from 2 to 66 years old. One hundred and twenty one fractures were treated in a non invasive way, the others 30 fractures were treated with internal fixation. The SPSS program 20.0 was used for the statistical analysis of the data.

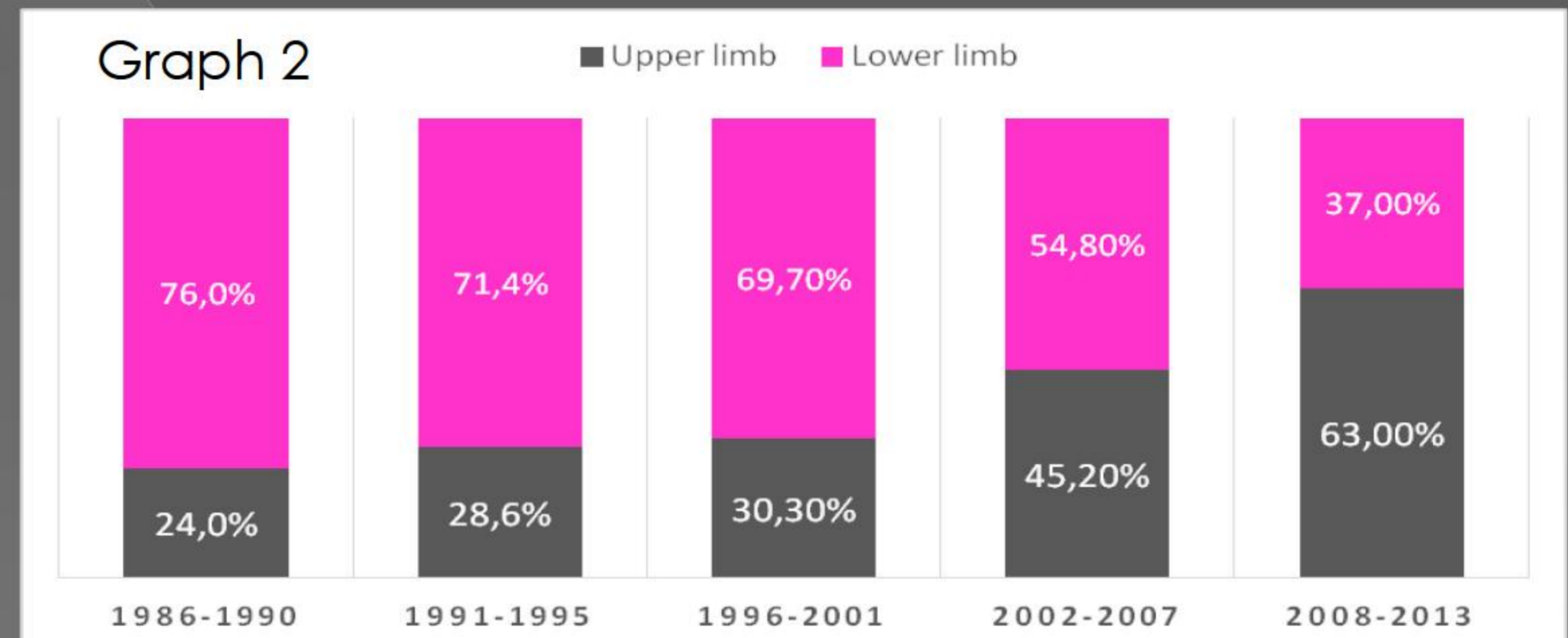
**Results:** In these 27 years the annual incidence of fractures has been 7 %. If we analyze the variation of the incidence of fracture according to each period: 1986-1990 was 2.3%, 1991-1995 was 2.4%, 1996-2001 was 2.6%, 2002-2007 was 1.6%, and 2008-2013 was 1.2% (Graph 1). The difference of the incidence of fracture in the population of PWH before and after year 2001 was statically significant (p=0.0003).

The incidence of presentation of the fractures of the upper limb or lower limb change through the years, being more frequent in the lower limb in the first period analyzed and in the upper limb in the last one. This difference was statically significant (p=0.0168). (Graph 2)

Graph 1 Fracture Incidence



Graph 2



Periods	N	Fracture Limb		Total Fractures	Mean Age	Patients Fractured	Fractures treated surgically
		Upper	Lower				
1986-1990	N	6	19	25	35	21	1
	%	24	76				
1991-1995	N	10	25	35	33	29	6
	%	28,6	71,4				
1996-2001	N	10	23	33	30	33	9
	%	30,3	69,7				
2002-2007	N	14	17	31	29	31	7
	%	45,2	54,8				
2008-2013	N	17	10	27	26	27	7
	%	63	37				
Total	N	57	94	151	32	141	30
	%	37.8	62.2				

If we analyzed the localization of the fracture, in the LL, the principal bone fractured was the femur 32% (n=48) followed by tibia 12,5% (n=18) and fibula 8% (n=12).

In the UL the localization is more varied, the principal bone fractured was the humerus 11,5% (n=17) followed by the radius 10,5% (n=16), ulna 9% (n=13) clavicle 6% (n=9) and phalanges 6% (n=9).

In relation with the age significant statistically differences regarding the age of the patients were observed between the first period and last period analyzed, (p = 0.035).

Table 1 shows the characteristic of the PWH analyzed.

**Conclusions:** Due to access to treatment, fractures in PWH have changed their pattern, lowering the age at which they occur, being less frequent with more patients activities, and being more common in the UL than in the LL.

With the advent of new and accessibly treatments for patients with hemophilia development of orthopedic complications decrease, and favors the improvement in quality of life of this patients.

## Bibliography

- Berntorp E. History of prophylaxis Haemophilia, 19, 163–165, 2013.
- Berntorp E, Astermark J, Baghaei F et al. Treatment of haemophilia A and B and von Willebrand's disease: summary and conclusions of a systematic review as part of a Swedish health-technology assessment. Haemophilia 18: 158–65. 2012
- Caviglia H, Perz Bianco R, Tezanos Pinto M. Therapeutic algorithms of muscular skeletal complications of hemophilia. ed ,Akadia 2006
- Caviglia H, Candela M, Galatro G, Neme D, Moretti N and Bianco RP. Elective orthopaedic surgery for haemophilia patients with inhibitors: single centre experience of 40 procedures and review of the literatura. Haemophilia, 1–10.2011.

