Hip Fracture in Individuals under 60 Years of Age. A Prospective Multi-Center Study of the Epidemiology, Treatment, Outcome and Patient Satisfaction Regarding Hip Fractures.

Statistical analysis plan

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1.a. Bone quality, demographics and hormonal status in hip fracture patients under 60 years of age.

First author: Strøm Rönnquist
Co-authors: (in random order) Åkesson; Palm, Tange Kristensen, Bech Jensen; Fladmose Madsen, Overgaard; Viberg.
Last author: Rogmark

Study design: Prospective multi-center cohort study
Participants: Approx. 200 individuals aged 18-60 years
Exposure: Acute, non-pathological hip fracture (intra- and extracapsular), regardless of trauma level
Control group: Cohorts of middle-aged, non-fractured individuals with DXA measurements at Odense and Skåne University Hospital
Aim:
1. Comparison of bone mineral density at the time of hip fracture (DXA scan) and basic risk factors for osteoporosis (BMI, smoking, etc. = variables accessible in the control groups)
Statistical analysis of categorical data using Chi-square test.

2. Descriptive analysis of other relevant factors in a young hip fracture cohort
Statistical analysis of categorical data using Chi-square test.

Collected variables in the prospective study:
Gender, age, BMI
Comorbidity, medication
Diet
Abuse – alcohol, drugs, tobacco, anabolic steroids
Socioeconomics (working capacity, type of living)
Fracture history (own and first-hand relatives)
Laboratory tests including hormonal status
DXA scan at the time of the fracture
Fracture pattern, type of trauma
Physical / functional level prefracture (New mobility score and others)
Health-related quality-of-life prefracture

Hypotheses:
There are differences in BMD and risk factors when comparing the hip fracture group with a standard control group.
Within the hip fracture group; different levels of BMD are associated with comorbidities, hormonal status and life style factors.

Perspective/clinical relevance:
To identify those patients who have an underlying cause or reason for sustaining a hip fracture in relatively young age and, when appropriate, initiate preventive measures for future fractures.

1.b. Association between fracture type, fracture trauma type and bone mineral density

First author: Strøm Rönnquist
Co-authors: (in random order) Åkesson; Palm, Tange Kristensen; Fladmose Madsen, Overgaard; Viberg.
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Study design: Prospective multi-center cohort study
Participants: Approx. 200 individuals aged 18-60 years
Exposure: Acute, non-pathological hip fracture (intra- and extracapsular) regardless of trauma level
Study groups: High and low bone mineral density; high and low trauma injuries.
Aim:
1. Analysis of association between bone mineral density at the time of hip fracture (DXA scan) and fracture type.

Statistical analysis of categorical data using Chi-square test.

2. Analysis of association between trauma type and fracture type.

Statistical analysis of categorical data using Chi-square test.

Collected variables in the prospective study:
Fracture pattern (femoral neck fracture – undisplaced and displaced; basocervical fracture; trochanteric fracture – stable and unstable; subtrochanteric fracture)
Type of trauma (other than low-energy, low-energy)
DXA scan at the time of the fracture
For adjustment:

Gender, age, BMI
Comorbidity, medication
Diet
Abuse – alcohol, drugs, tobacco, anabolic steroids
Socioeconomics (working capacity, type of living)
Fracture history (own and first-hand relatives)
Laboratory tests including hormonal status
Physical / functional level prefracture (New mobility score and others)
Health-related quality-of-life prefracture

Hypotheses:
There is no association between low BMD and displaced/unstable hip fracture
There is no association between higher trauma energy and displaced/unstable hip fracture.
There is an association when both low BMD and higher trauma energy exists and displaced/unstable hip fracture.

Perspective/clinical relevance:
To understand the interaction between trauma energy level and bone strength (as measured by DXA) and fracture type.