



# Effect of chronic heavy smoking on proximal humerus fractures

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# Target group

- Osteomyelitis
- Delayed union
- Non-union
  
- Limited studies
- **Retrospective comparative study**
- Chronic heavy smoking
- Closed proximal humerus fracture



# Study design

- 5-Year period, 1752 patients
- Chronic heavy smoking
- No hormonal disorders
- No medications affecting metabolism
- Given advice to stop smoking



**118 met the inclusion criteria**

- Comparative arm: age, sex, Neer, Rx requirements, closed fractures, non-smokers

# Outcome factors

- **Primary**

- Time to fracture union
- Time to wound healing

- **Secondary**

- Postoperative complications (pain, bleeding, swelling, infection, non-union, mal union, delayed union, compartment syndrome and neurovascular impairment)
- Satisfactory RoM at 4 weeks
- Mobility at last R/V (same before injury, worse)



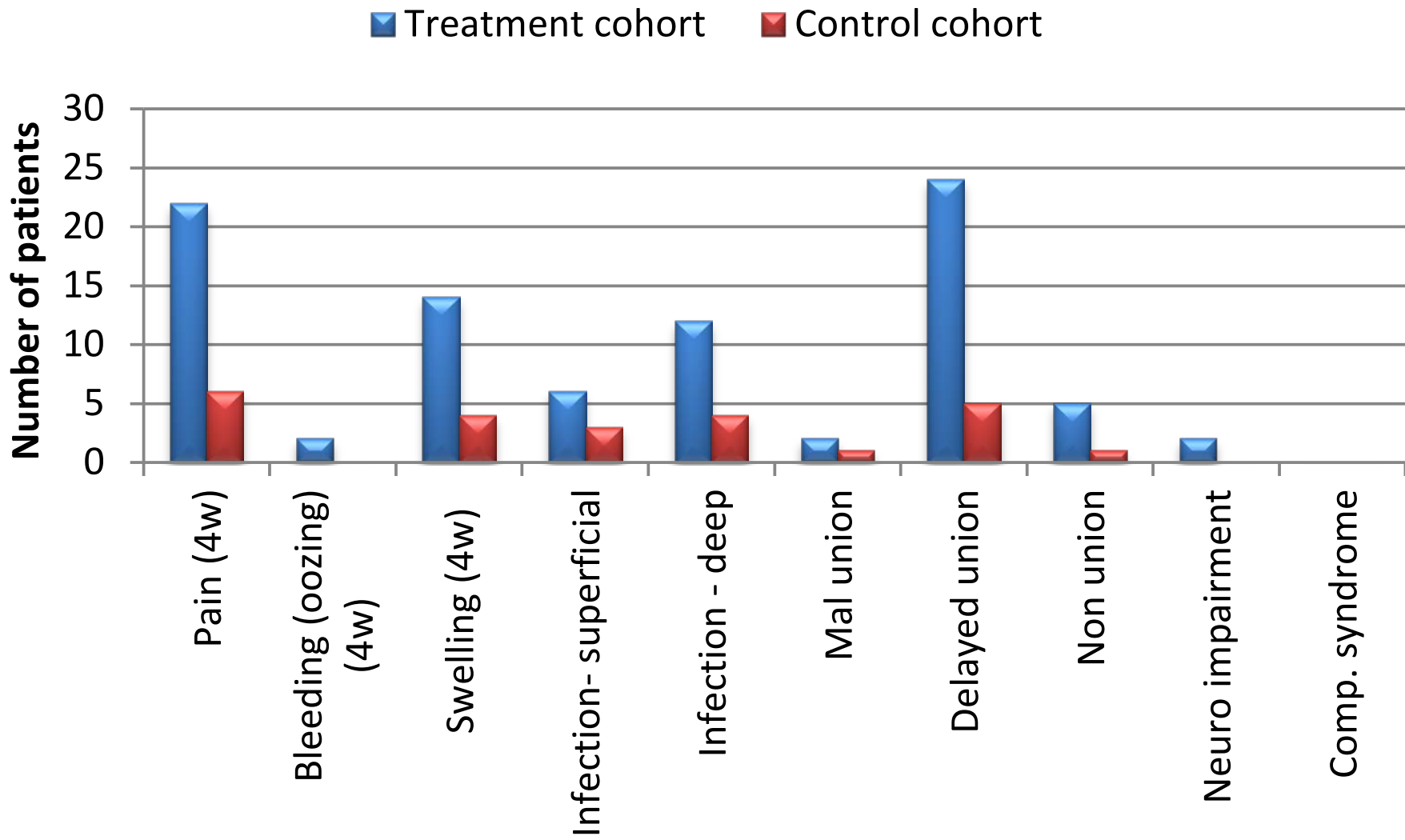
# Results

- CHS group
  - 31 males
  - 87 females
  - 57 years
  - 14 had ORIF
- Control group
  - 45 males
  - 73 females
  - 46 years
  - 10 had ORIF

One-part, two-part, three-part or four-part fracture and their displacements  $>1\text{cm}$  or  $>45^\circ$

<b>Primary outcomes</b>	<b>CHS</b>	<b>CHS</b>	<b>CHS</b>	<b>Control</b>
		Conservative	Surgical	
<b>Time to wound healing</b>				
Mean (weeks)	6	6	7	2
Minimum-Maximum	3-8	3-7	3-8	1-2
Standard deviation	±2	±2	±2	±1
<b>Time to union</b>				
Mean (weeks)	12	11	14	9
Minimum-Maximum	10-19	10-15	12-19	7-10
Standard deviation	±2	±1	±2	±1

Secondary outcomes	CHS group	Control	CHS vs. C	CHS vs. C
	n=118	n=118	Pearson	Fisher
Pain (4w)	22	6	<.001**	.002*
Bleeding (oozing) (4w)	2	0	-	-
Swelling (4w)	14	4	<.001**	.002*
Infection- superficial	6	3	.002*	.003*
Infection - deep	12	4	<.001**	.003*
Mal union	2	1	0.242	0.321
Delayed union	24	5	<.001**	.002*
Non union	5	1	.002*	.005*
Neuro impairment	2	0	-	-
Comp. syndrome	0	0	-	-





<b>Secondary outcomes II</b>	<b>CHS</b>	<b>Control</b>
<b>Satisfactory RoM (4w)</b>	96	103
<b>Mobility at last R/V</b>		
Same to before injury	92	109
Dependent – worse	14	6

# Effect of smoking

- Blood vessels lining
- Lipids level in the blood
  
- Many pathologies
- Atheroma formation
  
- Long-term excessive smoking
- Blood supply (reduced oxygenation)
- **Delayed union**
- **Poor wound healing**
- **Other complications**

# Conclusion

- Chronic heavy smokers
- Delayed fracture union
- **Surgical fixation**: poor wound healing, postoperative pain and deep surgical infection.
- Smoking cessation programmes

Thank you

Questions?