

A PILOT STUDY OF THE ASSOCIATION BETWEEN TOBACCO USE AND MID-TERM OUTCOMES FOLLOWING TOTAL HIP REPLACEMENT

INTRODUCTION

- Smoking is an important and modifiable risk factor in many disease processes and is thought to have an effect on bone mineral density.
- Although tobacco use has been shown to be associated with increased rates of complication in the early post operative period following total joint arthroplasty, it is not known if it affects long term survival of the joint.
- Mid-term hip arthroplasty surveillance provides evidence of the state of a joint replacement and is useful to determine whether further follow-up will be required.
- This retrospective cohort study was designed to evaluate mid-term outcomes post primary total hip replacement in patients who were tobacco users compared with those who were not.

MATERIALS AND METHODS

- Existing database of 1332 patients.
- Retrospective case-cohort method used to identify three groups with total hip replacements – smokers, ex-smokers and non-smokers.
- The patients had been reviewed between five and ten years post-operatively and were matched by case for age, gender, type of hip replacement and Charlson comorbidity score.
- Outcome measures were the Oxford Hip Score, and the number and type of radiographic changes. Statistical analysis was conducted with the Kruskal-Wallis and the Chi-square tests.

RESULTS

- Three groups of patients were compared (n=30 in each)
- There was a statistically significant difference in the proportion of patients with any radiographic change seen around the femoral component on antero-posterior (AP) view x-ray (Gruen zones 1 and 7): Chi-square 9.386, df 2, $p < 0.01$ (Figure 1)
- There was a statistically significant difference in the frequency of patients in each group with osteopenia in any femoral zone: Chi-square 19.85, df 2, $p < 0.0001$ (Figure 2)
- There was no significant difference in Oxford Hip score between the groups (Kruskal-Wallis test, $p = 0.83$).

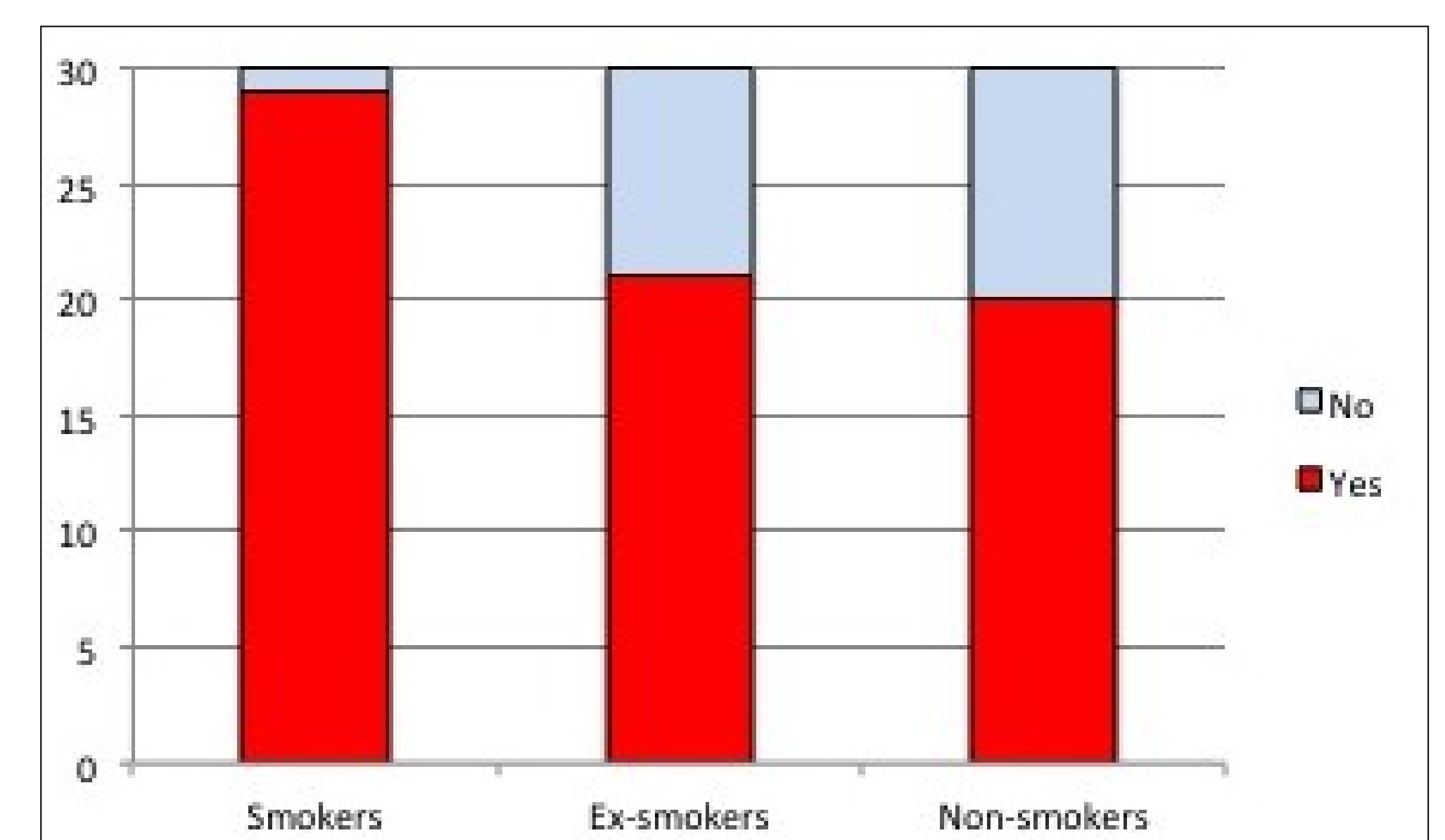


Figure 1. Any radiographic change ($p < 0.01$)

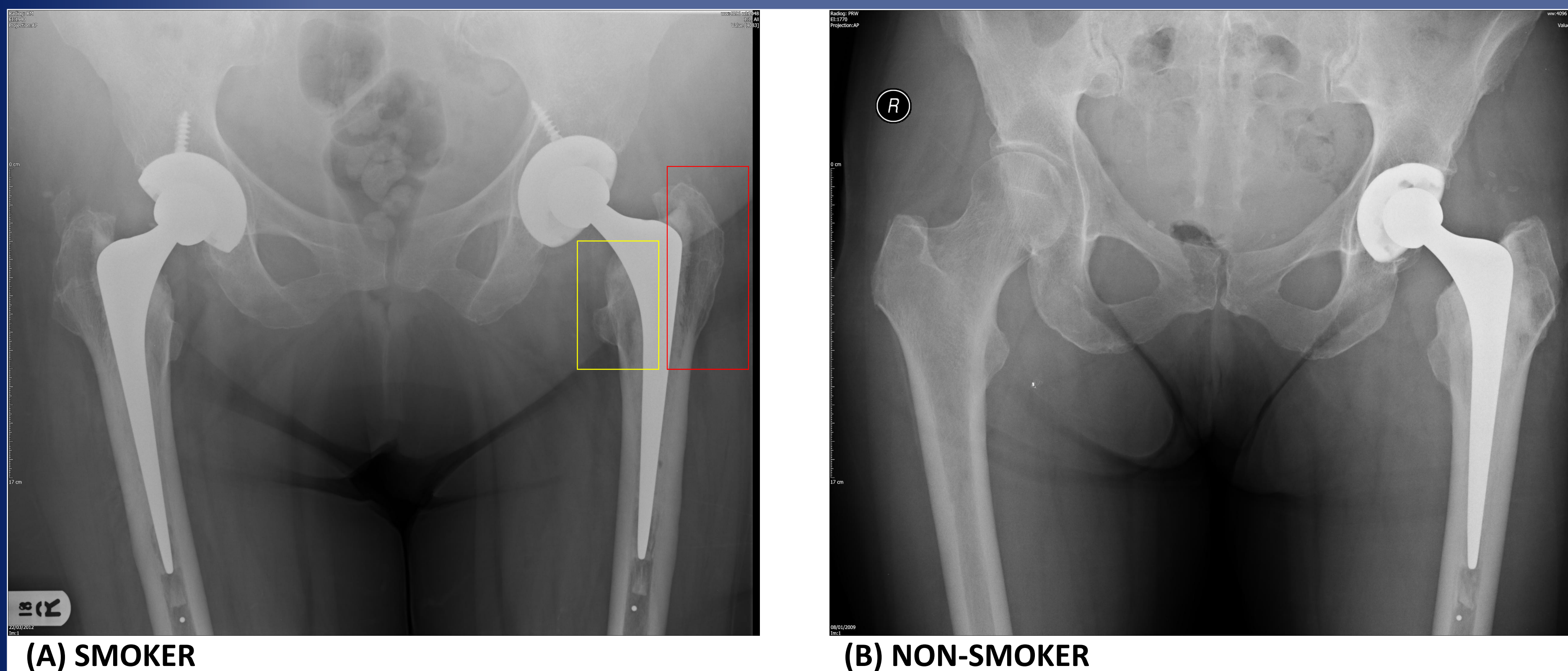


Figure 3. AP hip X-rays of 2 matched female patients 6 years post hip arthroplasty. A is a smoker, B is a non-smoker.

This pair of x-rays demonstrate the typical degenerative changes seen in those patients who smoke. These include a greater frequency of osteopenia and osteolysis, in Gruen zones 1 (red box) and 7 (yellow box). These changes are absent in the non-smoker.

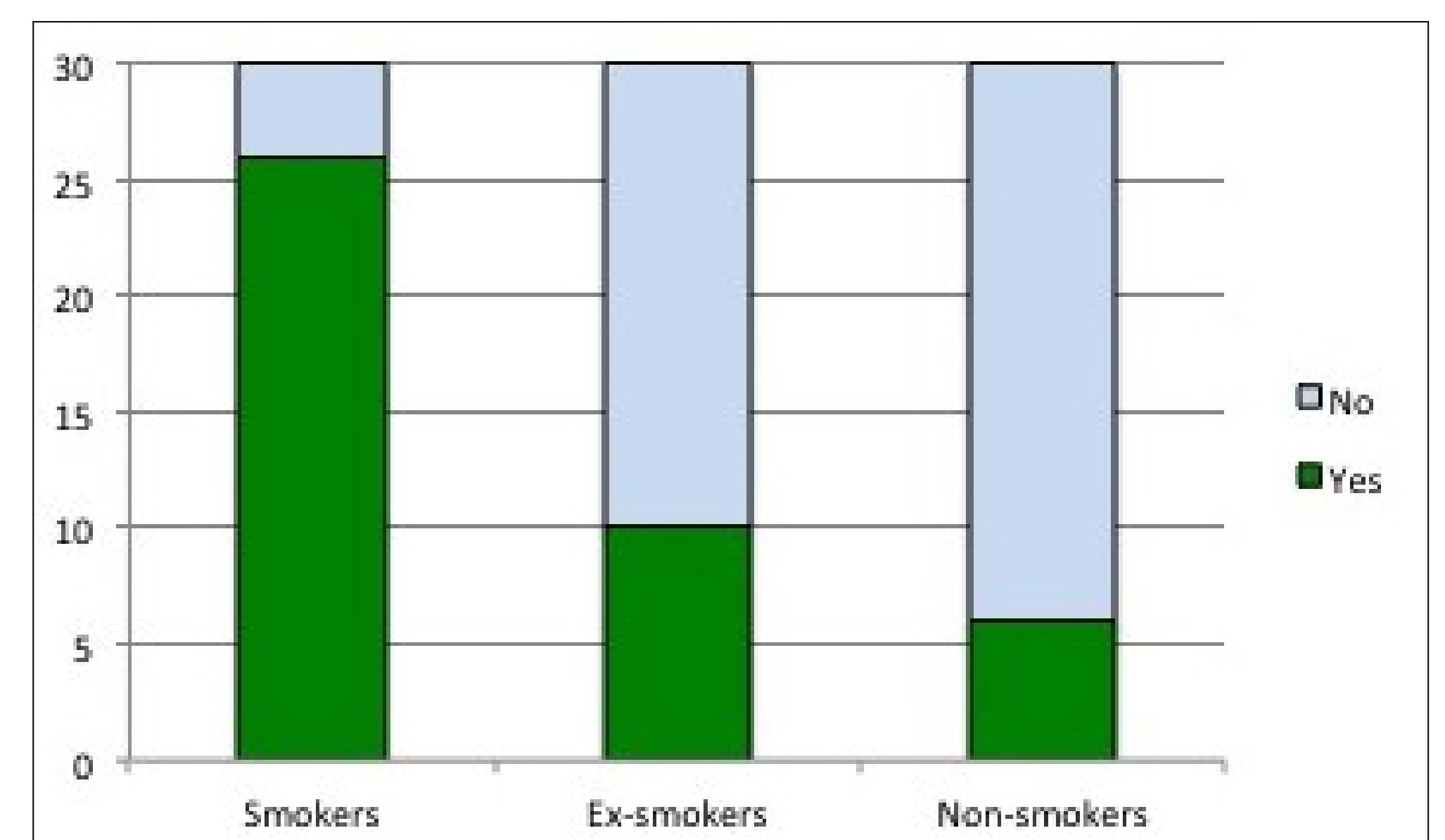


Figure 2. Osteopenia in any zone ($p < 0.0001$)

DISCUSSION

- In this small study, there were significantly more changes on x-ray at mid-term following total hip arthroplasty in patients who were smokers than non-smokers or ex-smokers.
- Reports in the dental literature suggest a deleterious effect of tobacco use on the survival of dental implants due to factors including the quality of the surrounding bone.
- It is not known if the same is true for hip arthroplasty but information derived from the present study may be used to inform further research to investigate the implications of tobacco use on survival of hip arthroplasty.

CONCLUSION

- Arthroplasty surveillance is useful for identification of patients with potentially damaging asymptomatic changes.
- This study suggests that patients who smoke experience a greater level of such changes than non-smokers, which is important when planning access to surveillance and the care of individual patients.