SUMMARY

282 patients underwent fusions at 485 disc levels using rhBMP-2 at various dosing between 4mg-12mg. Prospective data for 2-4 years follow-up was reviewed to evaluate the relationship between dose and clinical outcomes, fusion rates, and complications. All patients had significant improvements in VAS and ODI scores at 12 and 24 months. 4mg dosing lead to equivalent fusion rates and had lower complications related to rhBMP-2 than higher levels.

INTRODUCTION

TLIF with a PEEK cage is a common technique for anterior column support and arthrodesis. The optimum interbody dose of BMP however is yet undetermined. A few smaller series describe varying doses of BMP used in TLIF, but the small numbers have not provided convincing technical guidelines. This study examines the affect of interbody BMP dosage on fusion rates and complications.

METHODS

Prospective data on 282 consecutive adults undergoing posterior fusion with pedical screw instrumentation and TLIF with rhBMP-2 at 485 discs (L1-S1) was reviewed, with 4 years follow-up (24-76 months). Average age 60 years(19-88 years); diagnosis was degenerative in 124, spondylolisthesis in 92, and deformity in 66. BMP dosing averaged 8.4mg/disc level: 4mg-29, 6mg- 146, 8mg-159, 10mg-9 and 12mg-142 discs. Complications and outcomes (VAS, Oswestry) were followed for each dosage group.

RESULTS

All patients had significant improvements in their ODI and VAS scores at 12 months and 24 months. A total of 6 disc levels developed nonunions during follow-up for a 1.24 nonunion rate per disc level. These nonunions occurred in 6 patients of 282 for an overall patient based

nonunion rate of 2.13%. 4 nonunions occurred at the L5-S1 disc level, and 1 each at L4-5 and L3-4 disc levels. Dosing of the nonunion levels demonstrated 4 levels treated with 8 mg and 1 level each treated with 6mg and 4mg. Smoking was a factor in 2 nonunion patients. Complications related to BMP usage were seen in 5 of 282 patients 1.77%. 2 patients developed seroma (6mg and 8mg dosing), 3 had bony overgrowth into foramen (6mg and 8mg dosing). Other complications included 5 infections, 7 hardware requiring removal, and 101 adjacent degeneration (only 17 required revision), 19 adjacent fractures (only 7 required revision), 2 cases of arachnoiditis. No subsidence was seen.

CONCLUSIONS

BMP used in TLIF application appears to be safe and effective in fusion with a low complication rate. Dosing between 4mg/disc level appears to have less complications and better fusion rate than 6mg-12mg.

SIGNIFICANCE

This study demonstrates that 4mg dosing of rhBMP-2 in TLIF application demonstrates equivalent fusion rates with higher dosing with less complications related to rhBMP-2.