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# EXPERT OPINION ON PUBLISHED ARTICLES

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## Complications associated with the use of bone morphogenetic protein in pediatric patients

ME Oetgen, BS Richards

*J Pediatr Orthop* 2010;**30**:192-197

## Exaggerated inflammatory response after use of recombinant bone morphogenetic protein in recurrent unicameral bone cysts

KM MacDonald, MM Swanstrom, JJ McCarthy, BA Nemeth, TA Guliani, KJ Noonan KJ

*J Pediatr Orthop* 2010;**30**:199-205

There is little data regarding the safety of bone morphogenetic proteins (BMPs) in the paediatric population. Two interesting papers on the use of rhBMP-2 in children serve as a caution to those who consider its use in long bone pseudarthrosis, spinal fusions, treatment of unicameral bone cysts and those seeking new methods of evaluating the benefits of BMP in general.

The FDA has considered this product to be contraindicated in children as its safety has not been clearly demonstrated. The current use of this product is in an 'off-label' fashion.

Oetgen *et al* found 16 complications in patients under 18 years. Nine had local operative site problems such as drainage, swelling and dehiscence. One child had thigh compartment syndrome. Two had neurological complications – one had progressive myelopathy, another had weakness and dural fibrosis. In one patient an intracranial glioma was found to have undergone enlargement following use of BMP for spinal fusion in neurofibromatosis. The authors postulate that an intense inflammatory reaction is associated with BMP use.

MacDonald *et al* used BMP-2 in three patients with unicameral bone cysts (UBC). In these patients the BMP failed to resolve the UBC. In addition to poor radiological healing, all patients developed an exaggerated inflammatory

response with significant limb swelling and pain that mimicked infection. BMP is usually used with collagen sponges as carriers. It appears that percutaneous injection delivers supra physiological doses that result in non-physiological side effects.

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**Two interesting papers on the use of  
rhBMP-2 in children serve as a caution  
to those who consider its use**

A thorough knowledge of the possible risks and benefits of BMP is important. This should be discussed with the family before its use in children.