Bone & Joint Research

Murray IR, LaPrade RF. Platelet-rich plasma: Renewed scientific understanding must guide appropriate use. *Bone Joint Res* 2016;5:92-94.

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Sir,

We would like to congratulate the authors of this paper[1] on the responsible and intelligent comments on the concerns of using platelet-rich plasma (PRP).

In fact, the indiscriminate use of PRP has been noted in clinical practice, yet the rationale for using it is based on research that is only supported by a superficial histopathological picture, the results of which are inferred to be due to a growth factor (GF).[2] Indeed, the major concern about the use of PRP, and one that is ignored by the scientific literature, is the fact that it produces concentrations of GF that are more than 300 times higher than the physiological levels.[3] In addition, the pharmacokinetics of the GFs and how each GF acts on the cellular receptors and promotes the activation of response elements, secondary messengers or activation transcription factors remain unclear. However, it is important to bear in mind that the GF 'overdose' has the potential to cause severe pathological sequelae.

In support of our point of view, transforming growth factor-beta (TGF-β), for example, may interact with follicular cells in the thyroid and produce hyperplasia, resulting in significant changes to basal metabolism.[4] There is also evidence that TGF-β is a factor for pathological fibrosis and the development of cirrhosis.[5] Additionally, when associated with other factors, such as platelets, TGF-β may promote the formation of foam cells due to activation of the scavenger receptor[6] and, when co-expressed with vascular endothelial growth factor (VEGF), it has been reported to be associated with Alzheimer's disease and vascular dementia.[7]

Another important factor secreted by PRP is insulin-like growth factor 1 (IGF-1).[8] This peculiar GF is commonly produced in pulses by the liver, when activated by growth hormone. Despite this fact, IGF-1 is commonly ignored in PRP studies. If IGF-1 maintains the same pattern as the other GFs, the intermittent presence of IGF-1 may lead indirectly to acromegaly and alteration of the common hormonal homeostasis of the hypothalamus-pituitary axis. This would promote saturation of insulin receptors, triggering insulinaemia and diabetes. Furthermore, it is a major factor implicated in the development of rectal colon cancer.[9]

Thus, the key issue that should be addressed from the editorial, and our observations on it, is: “Is the benefit of faster repair more important than the risk of developing a serious pathology? And hence, why should I use PRP?”

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Conflict of Interest: None declared