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Erythropoietin; bright future and new hopes for an old drug

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ABSTRACT

Recent publications have suggested renoprotective actions for erythropoietin in certain models of acute kidney injury. In a study by Rafeian-Kopaei et al., the effects of erythropoietin on amelioration of gentamicin-induced renal toxicity was investigated and renoprotective effect for Eprex, an analogue of erythropoietin was shown when the drug was given in combination with gentamicin. There has also been a protective effect when the drug was applied after gentamicin administration. Thus, the drug was effective even after induction of tubular damage which opens a very valuable window for its therapeutic actions. However, there are still needs for studies on the mechanisms which are involved in these protective actions.

Implication for health policy/practice/research/medical education:

Eprex an erythropoietin analogue is a promising renoprotective drug to prevent or attenuate GM-induced tubular damage and introduces a novel therapeutic strategy for patients with renal tubular epithelial cell damage. However, there are still needs for studies on the mechanisms which are involved in these protective actions.

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Recent publications have suggested renoprotective actions for erythropoietin (EPO) in certain models of acute kidney injury. This drug is shown to exert cytoprotection, anti-inflammatory and anti-apoptotic properties in many organs including the kidney and liver. Erythropoietin receptors are found on renal tubular epithelial and endothelial cells. Studies also demonstrated that EPO may act directly on damaged tubular cells and stimulates their re-

generation (1, 2).

Gentamicin (GM) is an aminoglycoside antibiotic used in clinical practice to treat many types of bacterial infections. However, it has some nephrotoxicity which causes limitations in the extent of its use. In recent years there have been many studies on the mechanisms of GM-induced nephrotoxicity and reduction of the renal damage caused by it (3, 4).

In a new study by Rafeian-Kopaei et al. in this

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issue of journal, the effects of erythropoietin on amelioration of gentamicin-induced renal toxicity was investigated by biochemical and histopathological indices (5). A renoprotective effect for Eprex an analogue of erythropoietin was shown when the drug was given in combination with gentamicin. There has also been a protective effect when the drug was applied after gentamicin administration. Thus, the drug was effective even after induction of tubular damage which opens a very valuable window for its therapeutic actions. This study suggests, Eprex as a promising renoprotective drug to prevent or attenuate GM-induced tubular damage and introduces a novel therapeutic strategy for patients with this kind of kidney disease. However, there are still needs for studies on the mechanisms which are involved in these protective actions.

Conflict of interest

The author declared no competing interests.

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References

1. Patel NS, Collino M, Yaqoob MM, Thiemermann C. Erythropoietin in the intensive care unit: beyond treatment of anemia. *Ann Intensive Care*. 2011;1:40.
2. Johnson DW, Forman C, Vesey DA. Novel renoprotective actions of erythropoietin: new uses for an old hormone. *Nephrology (Carlton)*. 2006;11(4):306-12.
3. Kadkhodae M, Khastar H, Faghihi M, Ghaznavi R, Zahmatkesh M. Effects of co-supplementation of vitamins E and C on gentamicin-induced nephrotoxicity in rat. *Exp Physiol*. 2005;90(4):571-6.
4. Ghaznavi R, Faghihi M, Kadkhodae M, Shams S, Khastar H. Effects of nitric oxide on gentamicin toxicity in isolated perfused rat kidneys. *J Nephrol*. 2005;18(5):548-52.
5. Rafieian-Kopaei M, Nasri H, Nematbakhsh M, Baradaran A, Gheissari A, Rouhi H, et al. Erythropoietin ame-

liorates gentamicin-induced renal toxicity: A biochemical and histopathological study. *J Nephropathology*. 2012;1(2).