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Role of fasting in intestinal stem cell activation

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Stem cells are the special cells present in the body, which are inclined to lose their abilities with increasing age. There is evidence that ageing process could have adverse effects on them resulting in the deterioration of renewal ability and alteration in the ability to differentiate into the various cell types. Ways of their activation could resolve many dreadful diseases. Recently, researchers have discovered that fasting can enhance stem cell activation and proliferation. This hypothesis was proved by an experiment performed on mice. The experiment observations stated that, the organoids formed in mice undergoing fasting were more in number in comparison to that on a normal diet, both in young and aged mice. This proved that there is something occurring during the fasting stage that leads to such results. Through further studies, a metabolic pathway came to light. In normal dietary periods, the body tends to use glucose as a primary source for energy requirements but during fasting periods, the cells cannot obtain energy as a result of lack of glucose and thus resort to fatty acids as an alternative source. This shift causes the secretion of transcriptional factors (praR), which are responsible for gene activation to play a role in fatty-acid metabolism. This acts as a stimulus for the activation of intestinal stem cells. Activation of one such pathway may alter specific age phenotypes. This phenomenon could be used to treat gastrointestinal infections in all age groups. Also, it benefits cancer patients who receive chemotherapy, which often harms intestinal cells.

Keywords: Stem cells, Fasting, PRARs, Gastrointestinal infections, Cancer treatment

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