Medical Xpress

Breakthrough for treatment of fibrotic diseases

November 5 2018

Scientists have discovered a drug combination that could halt the progression of fibrosis—a condition believed to be responsible for almost half of all deaths—according to a study published in the journal *European Urology*.

Researchers from Anglia Ruskin University, University College London and KU Leuven have spent seven years working on finding the right drug combination to stop the scarring that causes Peyronie's Disease—a condition that causes penile curvature and inhibits erectile function in men.

Fibrosis is also responsible for conditions such as cirrhosis of the liver, kidney, lung and heart fibrosis. It occurs when a wound or injury causes a type of cell, called fibroblast, to morph into a different type of cell called myofibroblast in order to heal the wound.

Normally, once the wound is healed, the tissue structure returns to normal. However, in some cases the myofibroblasts do not return to their normal state, go out of control and 'overheals' the wound, resulting in a scar tissue, which is dead tissue that serves no function.

The presence of scar tissue in major organs such as the kidney, lungs, liver or heart, is a serious problem and is estimated by the United States government to be responsible for 45% of all deaths.

In this study, scientists developed a model to test 21 different drugs and

found that a combination of phosphodiesterase type 5 inhibitors (PDE5i) such as vardenafil (Levitra), sildenafil (Viagra) or tadalafil (Cialis) and selective oestrogen receptor modulators (SERM) such as tamoxifen or raloxifene was effective in halting the fibrosis that causes Peyronie's Disease, when tested on cells and in animals.

Lead author Professor Selim Cellek, of Anglia Ruskin University, said: "This is an extremely exciting development and one that has taken several years of hard work. Fibrosis is a very serious condition that, when it affects a major organ, can be fatal.

"The principle of fibrosis is what causes Peyronie's Disease and so this is an important breakthrough. Although we do not believe this particular drug combination will be able to reverse the fibrotic process, it has the potential to treat all fibrotic diseases and halt progression.

"To our knowledge, this is the first study of its kind to show a synergy between these two types of drugs. We look forward to taking this novel combination to clinical trials in the near future."

More information: Marcus M. Ilg et al, Antifibrotic Synergy Between Phosphodiesterase Type 5 Inhibitors and Selective Oestrogen Receptor Modulators in Peyronie's Disease Models, *European Urology* (2018). DOI: 10.1016/j.eururo.2018.10.014

Provided by Anglia Ruskin University

Citation: Breakthrough for treatment of fibrotic diseases (2018, November 5) retrieved 8 May 2024 from https://medicalxpress.com/news/2018-11-breakthrough-treatment-fibrotic-diseases.html

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