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Therapeutic Potential of Fresh Pomegranate in the Management of Pulmonary Fibrosis

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Abstract:

Lung fibrosis is a progression of lung disease distinguished by gradual scarring and deposition of lung tissue. It is an extremely challenging disease that impacts lung size and function. The development of lung fibrosis is comparable between smokers and non-smokers. There is no proof of a curative treatment. The principal objective of this inquiry was to present a clinical instance of lung fibrosis alongside the outcomes of a one-month treatment intervention involving the ingestion of fresh pomegranate juice. A diagnosis of pulmonary fibrosis was established in a male patient, aged eighteen years. The parents of the patient conveyed their curiosity regarding alternative therapy approaches considering the absence of a potentially curative medication for their son's condition at this time. It was recommended that an individual consume two 100 ml glasses of pomegranate fresh juice daily for duration of one month. Upon the expiration of one month, chest X-ray imaging revealed that lung fibrosis had been resolved to an almost complete degree. It has been demonstrated that overall consumption of freshly squeezed pomegranate juice mitigates the progression of pulmonary fibrosis.

INTRODUCTION

Lung fibrosis is a form of lung disease that is characterized by the gradual scarring and destruction of lung tissue (Wilson and Wynn, 2009). This occurs as a result of the progressive scarring and destruction of lung tissue. Because this tissue is denser and rigid, your lungs have to work harder to be healthy, which in turn makes it more difficult for them to perform their functions correctly (Savin *et al.,* 2022). As the degree of severity of pulmonary fibrosis continues to worsen, it is increasingly harder for you to breathe (King *et al.,* 2011). There is a wide range of potential causes for the scarring that is characteristic of pulmonary fibrosis, which can be brought on by a variety of different situations (Dong *et al.,* 2012). But, in the overwhelming majority of cases, medical specialists are unable to determine the underlying cause of the problem (Saito *et al.,* 2022). Idiopathic pulmonary fibrosis is the designation given to the condition when it is hard to ascertain what caused it. Idiopathic means "without a known cause" (Piotrowski *et al.,* 2022).

There is no way to reverse the damage that pulmonary fibrosis does to the lungs; however, there are medications and treatments that may be able to assist ease symptoms and improve the quality of life for those who have the condition. Lung transplantation might be the most effective course of treatment for some patients (Burgstaller *et al.,* 2017).

Both pirfenidone and nintedanib have been approved for use as therapies for the medical condition known as pulmonary fibrosis by the Food and Drug Administration (FDA). Pirfenidone, which belongs to the class of compounds known as pyridines, possesses properties that are anti-inflammatory, antioxidant, and anti-fibrotic. These effects are brought about by the regulation of several important pro-fibrotic molecules, such as TGF- and PDGF, in addition to the direct modification of collagen expression (Oku *et al.,* 2008). In clinical trials, patients with pulmonary fibrosis who received treatment with pirfenidone showed a significant improvement in their forced vital capacity (FVC) dynamics (King *et al.,* 2014). It was found that the tyrosine kinase inhibitor known as nintedanib could stop the differentiation of fibroblasts as well as their proliferation (Wollin *et al.,* 2014). During phases II and III of the study, patients who were suffering from pulmonary fibrosis and who participated in clinical trials of nintedanib saw significant improvements in their lung function. In addition, it has been demonstrated that the drug nintedanib is effective in treating patients with advanced lung fibrosis, while at the same time causing only minor adverse effects (Richeldi *et al.,* 2014).

Therapeutic uses of pomegranate juice

Pomegranate juice has been used in a variety of therapeutic applications, including the following:

Those who suffer from hypertension and hyperlipidemia may benefit from drinking pomegranate juice because it has been shown to lower blood pressure and improve endothelial function in these individuals (Aviram and Dornfeld, 2004). It has been discovered that extracts of pomegranate have anti-cancer properties against several types of cancer cells, including breast cancer cells, prostate cancer cells, colon cancer cells, and lung cancer cells (Adhami *et al.,* 2012). It has been discovered that pomegranate has anti-inflammatory effects. This is likely because it contains a high amount of polyphenols, which are known to reduce inflammation in the body (Seeram *et al.,* 2008). Pomegranate extracts have been shown to have anti-microbial actions against a wide variety of bacteria and fungi, including Staphylococcus aureus and Candida albicans, according to previous research (Chen *et al.,* 2020). Pomegranate has been discovered to have preventive effects against UV-induced damage to the skin due to the antioxidant and anti-inflammatory characteristics it possesses. Pomegranates can be beneficial to skin health in several ways (Afaq *et al.,* 2009).

Pomegranate has been found to have a role in treating fibrosis. Fibrosis is a pathological process that occurs when the body tries to repair damaged tissue by forming scar tissue. Pomegranate has been found to have anti-fibrotic effects due to its high content of polyphenols and other bioactive compounds (Xia *et al.,* 2022; Saparbekova *et al.,* 2023).

Several studies have shown that pomegranate can inhibit the growth and proliferation of fibroblast cells, which are responsible for producing excess collagen and other extracellular matrix proteins that contribute to fibrosis (Shema-Didi *et al.,* 2012; Saparbekova *et al.,* 2023).

Additionally, pomegranate has been found to reduce the expression of various pro-fibrotic cytokines and growth factors, such as transforming growth factor-beta (TGF-β) and connective tissue growth factor (CTGF), which play a key role in the development and progression of fibrosis (Hemmati *et al.,* 2013; Dudala *et al.,* 2021; Zamanian *et al.,* 2023). In another study, pomegranate fresh juice was used successfully in treating some cases of COVID-19 (Alkhatib, 2021).

Case presentation

A male patient aged eighteen years old was admitted to the medical facility (which was a military hospital) for consultations. As can be seen in the illustration, the patient was found to have fibrosis of the lungs (Figure 1). The doctors warned the parents that there are no treatments that may cure this illness. There were white areas on the lung that were characteristic of fibrosis.

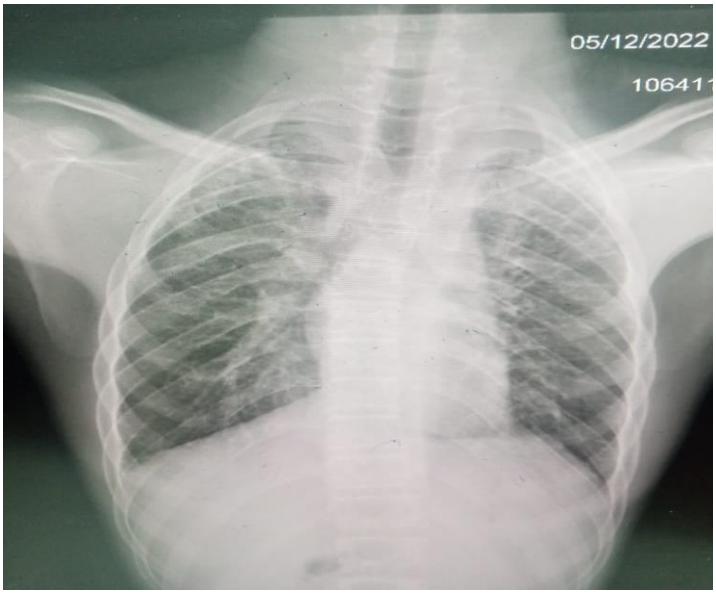

Fig. 1. Lung fibrosis patient’s chest X-ray before initiation the pomegranate treatment.

The patient's parents approached for other medical alternatives. It was recommended that the patient could drink two cups of fresh pomegranate juice daily for the next month to achieve the desired results (100 ml each). They concluded that it would be best to implement the recommendation, and it was reported that the patient's breathing became steadily better during the course of the treatment that they were receiving. After one month had passed, the patient underwent a second chest X-ray, and the results demonstrated that the fibrosis had nearly totally disappeared (Figure 2).

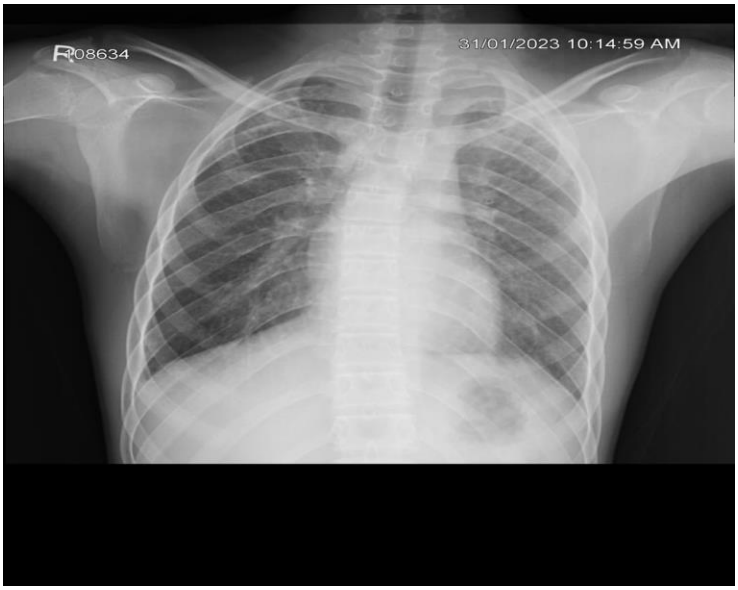

Fig. 2. Lung fibrosis patient's chest X-ray after initiation the pomegranate treatment by one month.

DISCUSSION

The current study is very significant because there is now only a limited quantity of scientific evidence that supports the use of pomegranate juice in the treatment of lung fibrosis. Chronic lung disease known as lung fibrosis is characterized by the formation of scar tissue in the lungs. This can cause difficulty breathing as well as a reduction in the function of the lungs (Wilson and Wynn, 2009; Savin *et al.,* 2022).

Pomegranate juice has anti-inflammatory properties as a result of the ingredients, such as antioxidants, that are already present in the juice. These properties allow the juice to reduce swelling and pain (Jurenka, 2008). There is some evidence that drinking pomegranate juice can improve lung function and reduce levels of inflammation in the lungs (Alkhatib *et al.,* 2022; Shaikh and Bhandary, 2021).

There is lack of direct evidence to support the use of pomegranate juice as a treatment for lung fibrosis. It has not been demonstrated that drinking pomegranate juice can be beneficial in the treatment of pulmonary fibrosis. The results of this study provided data to support the notion that consuming freshly squeezed pomegranate juice may lessen the detrimental consequences of lung fibrosis.

CONCLUSION

Although lung fibrosis is a very complicated disease and a potentially life-threatening condition, and even though its treatment and management are not simple tasks, the consumption of fresh pomegranate juice may be able to lessen the severity of its effects and restore lung function.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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