

# Indoor Staying During Winter Season Makes People More Susceptible to Flu

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## ABSTRACT

An infectious diseases caused by RNA virus, the influenza is also commonly known as Flu. It mainly transmitted through air by coughs or sneezes of infected. The symptoms of flu like fever and headache are the result of the huge amounts of proinflammatory cytokines and chemokines (such as interferon or tumor necrosis factor) produced from influenza-infected cells. The activated vitamin has extreme effects on human immunity. Vitamin D prevents too much release of cytokines and chemokines. Staying much time indoor, away from contact of sunlight during winter season lowers the vitamin D level in human body. Thus, the chance of getting flu increases in winter season. Formulation of policy regarding vitamin D supplementation in diet for people such as elderly and with low sunlight exposure is hereby recommended. It will be beneficial to reduce influenza related morbidity and mortality during winter season.

**Keywords:** Flu; influenza; indoor staying; susceptibility; winter season.

## INTRODUCTION

Influenza, commonly known as flu, is an infectious disease caused by RNA viruses of the family Orthomyxoviridae, the influenza viruses.<sup>1</sup> Genome organization and basic events in the development of influenza A virus. The processes of entry, transcription/replication and viral release are described. In this context, the roles of viral proteins (including recently discovered minor polypeptides Typically, influenza is transmitted through air by coughs or sneezes, creating aerosols containing the virus. <sup>2</sup> The most Common symptoms are fever, headache, chills, sore-throat, muscle pains, coughing, fatigue and general discomfort. Most infections resolve without complications after acute respiratory febrile illness. <sup>3</sup> However, flu can occasionally lead to pneumonia, either direct viral pneumonia or secondary bacterial pneumonia, a potentially fatal complication.<sup>4</sup>

## VITAMIN D

Vitamin D, a fat soluble vitamin, is primarily synthesized in the skin. Only when sunlight is inadequate is a dietary source required.<sup>5</sup> 7-Dehydrocholesterol (an intermediate

in the synthesis of cholesterol that accumulates in the skin), undergoes a nonenzymic reaction on exposure to ultraviolet light, yielding previtamin D. This undergoes a further reaction over a period of hours to form the vitamin itself, cholecalciferol, which is absorbed into the bloodstream.<sup>6</sup> Thus, the plasma concentration of vitamin D is highest at the end of summer and lowest at the end of winter.<sup>5</sup>

## ROLE OF VITAMIN D IN FLU PREVENTION

The symptoms of flu like fever and headache are the result of the huge amounts of proinflammatory cytokines and chemokines (such as interferons or tumor necrosis factor) produced from influenza-infected cells.<sup>7,8</sup>

The activated vitamin D i.e cholecalciferol has profound effects on human immunity. vitamin D has been found to modulate macrophages' response, preventing them from releasing too many inflammatory cytokines and chemokines.<sup>7</sup> The activated vitamin D acts as an immune system modulator, preventing excessive expression of inflammatory cytokines and increasing the 'oxidative burst' potential of macrophages. <sup>9</sup> Most importantly, it

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dramatically stimulates the expression of potent antimicrobial peptides (AMP) in neutrophils, monocytes, natural killer cells, and in epithelial cells lining the respiratory tract. These endogenous antibiotics i.e AMPs, such as defensins, and cathelicidins, directly destroy invading microorganisms thereby protecting the lung from infection.<sup>10,9</sup> AMP display broad-spectrum antimicrobial activity, including antiviral activity, and have been shown to inactivate the influenza virus.<sup>7</sup>

## RECOMMENDATION

Inadequate vitamin D nutrition is endemic among the elderly and people living under insufficient sunlight in the winter. Therefore, the formulation of policy regarding vitamin D supplementation in such people is beneficial which ultimately helps in reducing the influenza related morbidity and mortality in winter season. Also, the use of vitamin D as a prophylactic for influenza has shown promise in prevention of illness and reduction of secondary asthma in children.<sup>11</sup>

## CONCLUSIONS

Vitamin D has profound and multiple effects on human immunity. Staying at indoor for long period of time away from sunlight, the vitamin D level in the body falls down. Therefore, the chance of getting flue increases in winter season.

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