Tinnitus is defined as a perception of sound in the absence of a corresponding external acoustic stimulus [1]. Tinnitus is distinguished from auditory hallucinations, which frequently occur in patients with schizophrenia or other psychiatric disorders. While auditory hallucinations usually contain music playing or talking voice, tinnitus manifest as an unformed nature sound. Tinnitus patients usually describe the character of sound as ringing, crickets, roaring, ocean sound, buzzing, etc.

Tinnitus is a very prevalent symptom, prevalence of tinnitus in Korean adults is estimated to be 19.7%. Among those with tinnitus, 29.3% suffered annoying tinnitus that affected daily life [2].

Clinical manifestation of tinnitus is heterogeneous which makes it difficult to reveal its etiology. Tinnitus usually manifest with accompanying symptoms including anxiety, depression, insomnia, hearing loss and hyperacusis, which lower the quality of life [3].

In general, tinnitus can be classified as subjective and objective tinnitus [4]. An involuntary movement of middle ear muscle and turbulent sound of venous sinus or constricted artery can cause objective tinnitus that can be audible to an observer with a stethoscope, while subjective tinnitus is meaningless noise which is not associated with physical sound. Subjective tinnitus is more prevalent than objective tinnitus.

Due to the diverse clinical manifestations, the pathophysiologic mechanism of tinnitus is unclear. However, lots of attempts have been made trying to find the underlying mechanism of tinnitus generation. And recent advances in neuroimaging and development of animal models expand the pathophysiologic understanding of this condition [1,5].

Tinnitus is not a disease entity, rather a symptom of various underlying conditions. Classically tinnitus is considered as an otological disease, however some cases of tinnitus can be a warning sign of a life-threatening condition such as vestibular schwannoma or intracranial aneurysm [4,6]. In addition, its psychological influence can develop into a mood disorder leading to suicide [3]. Therefore, to access underlying cause and sequelae of tinnitus is a very important step for comprehensive tinnitus diagnosis.

Treatment of tinnitus is very challenging. Considering the underlying cause and comorbid disease, tinnitus managements include pharmacological therapy, intratympanic steroid injection, tinnitus retraining therapy, and cognitive behavioral therapy. In addition, surgical management, such as cochlear implantation and microvascular decompression attempt to eliminate tinnitus. Recently, experimental treatment of transcranial magnetic stimulation and vagus nerve stimulation accumulate the clinical evidence for their treatment relevance.

Herein, we review the pathophysiologic mechanism of tinnitus [7] and the role of functional image in tinnitus research [8]. Tinnitus and its psychological connections are also discussed [9]. Objective tinnitus which has different pathophysiology and management protocol is reviewed separately [10]. The assessment strategy for tinnitus [11] and several important management tools for subjective tinnitus including classical pharmacological intervention [12], tinnitus retraining therapy [13], intratympanic steroid injection [14], microvascular decompression surgery [15], and newly developed techniques of transcranial magnetic stimulation or vagus nerve stimulation [16], are systemically discussed.

We expect that this review will provide important guidelines for physicians to access and manage tinnitus patients.
REFERENCES