

GLUTATHIONE PEROXIDASE AND GLUTATHIONE:GLUTATHIONE DISULFIDE AS A PRESBYCUSIS RISK FACTOR

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Introduction

Advancement of various field, make life expectancy increase and there for the senior population will increase as a consequence. The population aged 65 years and older is increasing at a faster rate than the total population. The report further predicted that by 2030, 20% of the population will be 65 years or older. Nearly all otolaryngologists will be affected by these demographic realities. Optimal evaluation and management of these older adult patients will depend on new knowledge and skills.

Hearing loss is one the most common of chronic conditions affecting the older patient. Presbycusis is characterized by bilateral, symmetrical changes leading from an initial high to low frequency sensorineural hearing loss. In Indonesia, presbycusis affects 2.6% of population and affects 62% of people 55 years or older in Bandung. In Australia hearing loss affects 50% of the population aged 55 and over, it's currently about 1.5 million Australians. In the United States, hearing difficulty is reported by 25% to 30% of people 65 to 70 year group and by nearly 50% of those over 75 years of age.

GPx is an enzyme that serves to protect cytosol and mitochondria by detoxification peroxide using glutathione (GSH) as a co substrate and oxidation to glutathione disulfide (GSSG). GPx serves to protect erythrocytes and cells from oxidative damage. Intracellular GPx is the primary route of organic hydro peroxide reduction. There are 2 type of GPx in blood: GPx1/eGPx and GPx3/pGPx. GSH:GSSG is an effective indicator to determine the oxidative stress.

Progression and age-related onset of presbycusis are very variable, suggesting a multifactorial etiology. Both extrinsic factors, such as noise exposure, ototoxic medication, chemical exposure, medical conditions, nutrition intake, alcohol and tobacco intake. And intrinsic factors, such as systemic condition, arteriosclerosis, biological aging and genetic factors are thought to play a part in the resulting presbycusis.

Hearing loss increases the occurrence of misunderstandings and interpersonal conflicts, people with ARHL/presbycusis often experience difficulties adjusting to their disorder. In fact, hearing loss/presbycusis may have a major impact on the quality of life and the psychological well-being of affected persons. Communication difficulties will lead to poor psychosocial functioning, leading to social isolation as a consequence, and suffer from depression and paranoia.

Ageing is an extremely complex, multifactorial process and represents the gradual deterioration in function that occurs after maturity and leads to disability or death. There are many hypotheses in the current literature providing explanations for aging, the most convincing theories are the telomerase theory of aging, dysdifferentiation hypothesis of aging/apoptosis and Free radical theory of aging. The telomerase theory of aging suggests that there is a reduction in telomere length over time. It has been hypothesizes that the balance between telomere shortening and telomerase activity may underlie cellular aging processes. Dysdifferentiation hypothesis of aging suggests that aging is a continuum of programmed differentiation leading to either a cessation of normal gene activity or a systematic activation of genes whose effects are deleterious to cellular function. Support for this theory is provided by apoptosis.

Lastly, The Free Radical Theory or The Membrane hypothesis of aging states that aging is related to decreasing effectiveness of cellular protective and reparative mechanisms.

This Theory is the most plausible and acceptable explanations for the mechanistic basis of aging. This theory postulates that aging and its related diseases are the consequence of free radical-induced damage to cellular macromolecules and the inability to counterbalance these changes by endogenous anti-oxidant defenses. Based on a wide variety of studies performed in humans as well as in various animal models and microbial systems, reactive oxygen species (ROS)/free radicals are believed to play a key role in the aging process. The production of ROS/free radicals