Recent Research on Mechanistic Determinants, Biomarkers and Possible Holdup of Geriatrics

Imran Bashir¹*, Harmeet Kour² and Ujala Nabi³

¹Dr. Imran Bashir, Masters in veterinary sciences, Veterinary Surgery and Radiology, Faculty of Veterinary Sciences and Animal Husbandry. SKUAST-K.
²Dr. Harmeet Kour, Masters in veterinary sciences, Veterinary Surgery and Radiology, Faculty of Veterinary Sciences and Animal Husbandry. SKUAST-K.
³Masters in veterinary sciences, Veterinary Surgery and Radiology, Faculty of Veterinary Sciences and Animal Husbandry. SKUAST-K. Masters in veterinary sciences, Veterinary Surgery and Radiology, Faculty of Veterinary Sciences and Animal Husbandry. SKUAST-K.

I. INTRODUCTION

Aging is a universal phenomenon which can be either programmed or stochastic. The programmed ageing includes a wide range of genetic determinants while the stochastic process includes mitochondrial and somatic mutations, oxidative stress and protein glycation [1,2]. However, these hypotheses have been unable to link the proximate and ultimate processes of geriatrics. Research does not leave any doubt that ageing is naturally selected and genetically programmed in all animal species [1]. It is considered as a complex multifactorial process that results in progressive morbidity and disability [3]. The hypothalamic, pituitary and adrenal glands are an important hormonal system that determines homeostatic function. Present research findings have proposed that ageing is associated with enhanced cortisol levels in cerebrospinal fluid and particularly ventricular, and concomitant increased cortisol level in blood [4]. Various studies have proposed that life expectancy is not always proportional to reduced metabolic rate however; organ metabolic rate and energy expenditure may be a more appropriate determinant of geriatrics [5].

II. OXIDATIVE DAMAGE AND GERIATRICS

Oxidative damage appears to be an early and consistent alteration linked with the aging canine neurological metabolic syndrome, and is considered as important determinant of the lifespan. There are variety of metabolism-related features have an impact on aging processes; nongenetic determinants such as, nutrient deprivation or low temperature and mutations are associated with an increased metabolic efficiency and diminished metabolic rate [6,7]. Geriatric organisms down regulate metabolic rate as an adaptation to the cellular nutrient stress, [8,9].
III. HORMONAL IMBALANCE AND GERIATRICS

Metabolic alterations are closely linked with endocrine function. Chronic hyperglycaemia elicits aging-like alterations in ventromedial hypothalamus and hyperinsulinaemia followed by insulin resistance [10]. Increased insulin exposure results a ‘vicious circle’ which may also control the rate of mammalian ageing and age related diseases [11]. The neuroendocrine alterations follow a stereotypic pattern in geriatric animals. In general, cytoprotective and proglycolytic hormones like insulin, gonadal steroids, melatonin and thyroid hormones decrease with aging [12]. Aging is routinely associated with insulin insensitivity, glucose intolerance [13] and leptin insensitivity [14] which appears to be common determinants of the metabolic syndrome X [15, 16].

4. METABOLISM AND GERIATRICS

Atherosclerosis and other cardiovascular diseases are main metabolic disorders contributing to premature morbidity and mortality [17,18]. Epidemiological [19] and cell biological evidences [20,21,22] indicate that pathophysiology of geriatrics related diseases such as NIDDM, hypertension, atherosclerosis and cancer unfold at a continuum of shared risk factors. There are reports of vulnerabilities and molecular processes linked to oxidative stress, mutability and insulin/growth factor exposure. The geriatrics -related derangement of hormonal balances [23] further deteriorates and results in metabolic syndrome and associated geriatrics related diseases [24,25]. In contrast, the hypothalamus pituitary axis (HPA) is activated in comparison to healthy age-matched control [1,3,6,26].

5. ENDOCRINE DISEASES AND GERIATRICS

Endocrine diseases are common in the geriatric dog and are mainly represented by insulinoma, hyperadrenocorticism, phaeochromocytoma, hyperparathyroidism, diabetes mellitus and hypothyroidism. An elevated level of parathyroid hormone (PTH) has been described in old humans and rats [27]. Geriatrics predisposes individuals to insulin resistance and prevalence of diabetes increases markedly with advancement of age resistance of peripheral tissues to insulin action is known to contribute to the development of the disease [23]. This insulin resistance is tissue-specific in nondiabetic and insulin-resistant old Wistar rats (24-month-old). Decreased cellular insulin signalling is a potential mechanism responsible for the defects in insulin action characteristic of old age from data it is evident that white adipose tissue (WAT) is extremely insulin resistant in old rats, [23]. However, a decline in insulin receptor (IR) and insulin receptor tyrosine phosphorylation was found after insulin stimulation in vivo in liver and skeletal muscle of aged rats. More importantly, canines show substantial cognitive impairment with increased age in measures of object recognition memory. Earlier findings showed that the hippocampus lose approximately 50% of mineralocorticoid receptors as well as some of the glucocorticoid receptor sites with ageing [28,29,30]. The feedback regulation via hippocampal mineralocorticoid receptors became more susceptible in elderly subjects leading to an elevated responsiveness of HPA axis and increased basal cortisol levels [31,32].

6. BIOMARKERS OF GERIATRICS

The concept of biomarkers of aging and age-related disease began to appear in the gerontology in the early 1980s. In early days, the interest was in eliminating the confounding influence of disease from research on aging so that indicators of underlying processes of aging could be determined [33,34]. An ideal biomarker of Aging
must possess the quality to postulate accurately functional capability of organs at some later age. Presently mtDNA deletions has been detected as most eligible biomarker of aging [35]

7. CONCLUSIONS
There is increased incidence of geriatric related disorders due change in lifestyle and dietary habits. So need of an hour is to address the age related disorders and search for the risk factors associated with ageing and their rectification.

REFERENCE