
Case Study**Hutchinson-Gilford Progeria Syndrome in a Young Man****Maryam. Moinazad Tehrani MD¹, Agin Khosrow MD²**¹Loqman Hakim General Teaching Hospital Shahid Beheshti University of Medical Sciences(SBMUS),
Tehran, Iran²Professor of Medicine. Specialist in Internal Medicine, Pulmonologist, Pulmonary Critical Care, Head of
Heart and Lung Division, Loqman Hakeem Teaching General Hospital Shahid Beheshti University of
Medical Sciences, Tehran, Iran.**Corresponding author: Agin Kh, MD.**

Abstract:

Hutchinson-Gilford progeria syndrome (HGPS) is an extremely rare genetic disorder. It shows a characteristic progeria phenotype. The average life expectancy of HGPS patients is reported to be ~ 14.6 years. A case was a 33-year-old man with progeria phenotype, severe cardiac failure, and convulsion. He had several cardiac surgeries include Mitral and Aortic valve replacement, Atrial Septum Defect (ASD) closure and Coronary Artery Bypass Graft (CABG) .

Keywords: Progeria syndrome,cardiac failure,atherosclerosis,short stature**Introduction**

Hutchinson-Gilford Progeria Syndrome (HGPS), Progeria, is a rare genetic and fatal disorder. Jonathan Hutchison (1986) and Hastings Gilford (1897) studied the disease. Progeria is originated from the Greek terminology “progeria” means “prematurely old”. Its prevalence was 1 per 4–8 million people. HGPS is manifested in premature children. It is presented in both sexes with a male/female ratio of 2 : 1. The average life expectancy of HGPS patients is reported to be ~ 14.6 years(1).However, no geographic and ethnic bias has been found between different countries (2).

Case

The patient's consent was issued for the publication of a medical history. A 33- year-old man was known as progeria syndrome. He was the accountant of a factory. He was the first child of a family marriage and has one healthy sister and two healthy brothers.He was born at 35 weeks of pregnancy due to maternal trauma. The weight was 1700 grams at birth.He had been good growth until 8year-old. The high growth rate was progressively decreased. He was referred to an endocrinologist for evaluation of short status at 11 years.

He was complained from palpitation at 20 years old-age and leads to cardiac surgery for artificial aortic and mitral valve replacement. The ASD closure was performed. He was admitted to the hospital at 32 year- old with chest pain. Computerized Tomography(CT scan) angiography revealed thoracic aorta calcification and atherosclerotic changes of Aorta, stenosis at the midportion of the left subclavian artery, mild stenosis of the left common carotid artery, enlargement of the pulmonary artery, calcification of ascending aorta, and aortic arch & descending thoracic aorta.

Multislice CT angiography of coronary arteries displayed

calcified and noncalcified plaques and mild stenosis on left main coronary artery. In addition, CTscan disclosed diffuse calcified plaques, stenosis at all portion of the left anterior descending artery and left circumflex artery, calcified plaques and significant stenosis on right coronary artery. CABG was carried out for left anterior descending (LAD), obtuse marginal, Diagonal and Posterior Descending Artery(PDA).

He was good until about 20- years old. He complained hair loss of scalp and eyebrows. The first seizure was occurring at 30 years old with the repetition feature. Moreover, he had hospitalization history for severe pulmonary infection at 31 years old and gallbladder stone. In recent year, he was disabled due to cardiac failure.

physical examination showed a 32-year-old man with alopecia and prominent forehead, protuberant eyes, dental irregularity, deformed and atrophied nails of hands and feet. Height and weight were 140cm and 32kg, respectively. Blood pressure, pulse rate, and oxygen hemostases were 100/70mm Hg, 130 regular/ minutes and oxygen saturation 96 %, respectively. Cardiac examination was recorded the metallic sounds at aorta and mitral foci.He has normal speech with hearing loss.He also has keratoconus and eye frog. No edema and clubbing were found in the extremities. Fig1 and Fig 2 reveal the characteristic of face and ECG of the HGPS.

Electrocardiogram record (ECG)showed sinus tachycardia, normal axis, left bundle branch block, left atrium enlargement, prominent P wave in lead II, secondary ST segment changes to Left Bundle Branch Block (LBBB).

TransThoracic Echocardiography (TTE) and Tissue Doppler Imaging (TDI) reported left ventricle size (LV) was mildly dilated, no LVH, severe systolic dysfunction. Global Ejection

Fraction (GEF) was estimated 20%. A large area of regional wall motion abnormality(RWMA) was detected in both anterior and posterior coronary circulation.RV and RA size was normal. Moderate dysfunction was showed in RV. However, LA size was dilated.Mitral valve was bi-leaflet prosthetic. It was associated with the prosthetic Aortic valve.Tricuspid and Pulmonic valves were normal.

Discussion

Progeria is a rare genetic disorder characterized by premature aging that eventually leads to death(2). A child with progeria is borne normally. Dysmorphic features appear progressively with increasing age.The clinical features include retarded growth rate, narrow chest, baldness, macrocephaly, pinched beaked nose (bird-like face), and protuberant eyes with the absence of eyebrows and lashes. The skin appears senile texture with spots along with the loss of subcutaneous fat. Oral cavity was deformed with irregular teeth. Fingers and toes were malformed. musculoskeletal abnormalities occurred due to osteoporosis and skeletal dysplasia, with swollen stiff joints and hip dislocations. Presence of abnormal collagen in the body of HGPS patients lead to generalized atherosclerosis, accelerated, and premature arteriosclerotic disease (3). Cardiovascular complications and strokes manifested at around the 13 years old-age(4). No effective medication has been suggested as yet. The FarnesylTransferase Inhibitors (FTIs) may be a hope in the dark(2). A farnesyltransferase inhibitors (a progerin-blocker drug Rapamycin) has been experimentally reported to remove progerin in children with progeria(3).

In the recent decades, remarkable progress has been made in the understanding of the mechanisms of premature aging. The point mutation in the Lamina A/C (LMNA)gene causes expression of a protein that influences on the normal duration of the aging process. It promotes the early aging. The progerin is a protein as inducing disease. Progerin causes extensive atherosclerosis and cardiac electrophysiological alterations that invariably lead to premature aging and death(5). Lamin A is an inner nuclear membrane protein that broadly influences on the nuclear structure and function. Both lamin A and progerin are anchored into the inner nuclear membrane by a farnesyl moiety. It facilitates normal lamin A function and progerin's cellular damage (6).

Conclusion: The progeria patients have short survival. Increased the knowledge of the pathophysiology disease, early diagnosis and surgical treatment for cardiovascular complications are effective in the lifespan.

Acknowledgements:

With special thanks to doctor Marzieh masihpoor& Sadigheh Ebrahimi Daneshmand & Mehdi Nikbin, our dear colleges in social security organization.

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