Neonatal Marfan Syndrome — A Case Report
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Neonatal Marfan syndrome is a rare congenital abnormality with atypical features of Marfan syndrome at an early stage. Although, neonatal Marfan syndrome is part of Marfan syndrome, its higher morbidity and mortality rate within young children period are different from those of classic Marfan syndrome noted in older patients. Several diversities of family history, cardiovascular system and cause of death are pointed out from recent studies.

Key Words: Neonatal Marfan syndrome • Congenital abnormality • Classic Marfan syndrome

INTRODUCTION

Marfan syndrome is rarely diagnosed early in neonatal or young age. Neonatal Marfan syndrome is a congenital abnormality with atypical features of Marfan syndrome at an early stage, and it presents the appearances of tall stature, thin body build, long arms, legs, fingers and toes like Marfan syndrome. From genetic studies, Marfan syndrome is a heritable disorder with family history on chromosome 15, but spontaneous mutation tendency without family history was found in neonatal Marfan syndrome. More severe cardiovascular complications and poor prognosis were noted from neonatal Marfan syndrome. Higher morbidity and mortality rates during young age were also pointed out than classic Marfan syndrome.

Early diagnosis and realization of differences between neonatal Marfan syndrome and classic Marfan could help physicians to treat such kind of patients and explain to the family. We report a case of neonatal Marfan syndrome and summarize this disease.

CASE REPORT

The patient was a one-day-old male neonate who was born after 40 weeks gestation via normal delivery in our hospital. His birth body weight was 3272 grams and the Apgar scores were 7 and 9 at 1 and 5 minutes, respectively. No disease during the pregnant period of the mother was noted, nor was any inheritable family disease noted among the parents. The parents of the neonate were generally normal-figure appearance (father: age: 33 years old, body height: 176 cm; body weight: 68 kg; mother: age: 32 years old, body height: 156 cm; body weight: 53 kg), and without any ocular or cardiovascular disease.

Several bizarre appearances of the neonate were noted, including: dolicocephaly, arachnodactyly (Figure 1A), pigeon chest (Figure 1B), cyanosis, generalized pale appearance, rigidity and contracture of bilateral elbows, knees, and shoulder joints. Also, Gr. II/VI systolic murmur over left lower sternal border was found during acoustic examination.

Cardiomegaly and pulmonary venous congestion were also detected from chest roentgenography. There were several abnormal findings from cardiac echo: 1. aortic root were dilatated in the ascending aorta; 2. patent ductus arteriosus with bi-directional shunt; 3. atrial septum defect with bi-directional shunt; 4. mitral valve regurgitation (MR)(+++), tricuspid valve regurgitation (TR)(+++), pulmonary valve regurgitation (PR)(+++), aortic valve regurgitation (AR)(+++), and congestive heart failure.

After consulting geneticist, the neonatal Marfan syn-
drome was impressed. The karyotype of the neonate was 46XY. There was no unusual finding pointed out in bilateral eyes of the patient after consultation of ophthalmologist.

We treated the patient with diuretics and ACE inhibitor at the same time due to the detection of congestive heart failure. The conditions of congestive heart failure seem not ameliorated, and digoxin was prescribed to prevent the state becoming worse. However, dilatation of aorta, MR, TR, AR and congestive heart failure got worse progressively (Figures 2 A, B) and unfortunately, the patient expired due to severe congestive heart failure on the 52nd day after admission.

DISCUSSION

Marfan syndrome (MFS), first described in a 5-year-old child by the French pediatrician Antoine Marfan in 1896,1 is a dominantly inherited connective tissue disease with a wide range of phenotype severity in the skeletal, ocular and cardiovascular systems. The prevalence of MFS has been estimated to be approximately 4 to 6 per 100,000 population in the United States,2 and equally common in males and females.

MFS is a heritable disorder where abnormalities of fibrillin protein are encoded by the fibrillin-1 gene (FBN1), a large gene composed of 65 exons on chromosome 15q15-q21.3.3 The “neonatal Marfan syndrome” or “infantile Marfan syndrome” is a part of MFS whose atypical features of cardiovascular system with long, thin spindly physique can be detected at an early stage,4 but the neonatal MFS presents diverseness from older Marfan syndrome (or “classic Marfan syndrome”). It is likely a new mutation, not the family-inherited type from...
Neonatal Marfan Syndrome

| Table 1. Comparison between neonatal Marfan syndrome and classic Marfan syndrome |
|-----------------------------------------------|-----------------|-----------------|
| **Clinical characteristics**                  | **Neonatal Marfan syndrome** | **Classic Marfan syndrome** |
| Age at death                                  | Less than 2 years | 32 ± 16 years |
| Main cause of death                           | CHF associated with MR and TR | Aortic dissection or rupture |
| Family history of Marfan syndrome             | Negative in 70-100% | Negative in only about 20-30% |
| Joint contractures                            | 47-64%           | Uncommon        |
| Cardiovascular characteristics                | 73-100%          | 60 to 90%       |
| MVP                                           | 89%              | 13%             |
| MR (moderate to severe)                       | 80-100%          | 60-85%          |
| Aortic dilation                               | 11%              | 73%             |
| AR                                            | 67%              | Uncommon        |
| TR                                            | 22%              | Uncommon        |
| PR                                            |                  |                 |

CHF = congestive heart failure; MVP = mitral valve prolapse; AR = aortic regurgitation; TR = tricuspid regurgitation; MR = mitral regurgitation; PR = pulmonary regurgitation.

The skeletal manifestations of MFS include tall stature, thin body build, long arms and legs (dolichostenomelia), long fingers and toes (arachnodactyly), hyperextensibility, pectus deformity, scoliosis, joint contractures, and narrow, high-arched palate. Neonatal MFS presents more joint contracture (67%) than classic MFS. In follow-up, neonatal MFS also have considerable morbidity due to scoliosis (32%) and easily dislocatable joint (36%).

The majority of cardiovascular abnormalities of patients with MFS are associated with the ascending aorta, aortic valve, and the mitral valve, of which the most common are aortic root dilatation, aortic regurgitation, and mitral valve prolapse.

The cardiovascular abnormalities in neonatal MFS differ somewhat from those seen in older patients. Multivalvular abnormalities are the major frequent cardiac pathology in children compared to aortic complications in adults. In these neonates, there are significant mitral, tricuspid, and pulmonary regurgitations noted, whereas among adult patients aortic root dilatation, aortic regurgitation, and aortic dissection are predominante. In addition, children with MFS have tendency of obvious heart failure.

Cardiovascular problems are responsible for at least 80% of deaths in MFS. The main cause and mean age at death are different between neonatal and classic MFS. Congestive heart failure with mitral and tricuspid regurgitation is the main reason of death in neonatal MFS within the first year of life, but aortic dissection or rupture is the major cause of death of classic MFS during 33.5 years of life (Table 1). The neonatal MFS life span is less than 2 years, due to the reason of severity of cardiovascular problems.

Neonatal MFS has higher morbidity and mortality rate within young age than classic MFS, therefore, the pediatric cardiologist should explain the complications to the families, and some degree of psychosocial support may be needed.

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新生兒 Marfan 症候群 — 病例報告

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新生兒 Marfan 症候群為一種染色體先天性異常的疾病。在新生兒時期即表現 Marfan 症候群的病徵是相當罕見。雖然新生兒 Marfan 症候群是屬於 Marfan 症候群的一部分，但是其所特有的高死亡率和高罹病率特徵卻不同於一般典型的 Marfan 症候群。從近期文獻中顯示，新生兒 Marfan 症候群在心臓血管系統及家族遺傳與一般典型的 Marfan 症候群有著許多顯著的不同點。因此，藉由本文中罕見的病例以及文獻回顧來比較兩者的不同。

關鍵詞：新生兒 Marfan 症候群、先天性異常、典型 Marfan 症候群。