MYOTONIC DYSTROPHY IN THE LWC-STRAIN OF JAPANESE QUAILS: MORPHOLOGICAL STUDY OF SKELETAL MUSCLES

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A newly established strain (LWC) of Japanese quails clinically exhibits difficulty in lifting the wings and histologically has myotonic dystrophy-like lesions. In these experiments, morphological changes of muscle lesions in quails of the LWC strain were studied in more detail.

Nine quails (13～21 monts old) which showed difficulty in lifting their wings were killed and necropsied. Superficial and deep pectoral muscles, internal and external coracobrachial muscles, and muscles of the brachium, femur and crus, from right and left sides were examined histologically. In addition, right and left superficial and deep pectoral muscles were examined ultrastructurally.

Histologically, rounded fibers, sarcoplasmic masses and ring fibers were common in the muscles examined. These lesions were especially prominent in the superficial pectoral muscles, internal and external coracobrachial muscles, and muscles of the brachium. Although the changes showed some individual variations in degree, the distribution and severity of the lesions were almost symmetrical.

Ultrastructurally, the sarcoplasmic masses consisted of degeneration and disappearance of myofibrils, increase of glycogen granules, ribosomes and mitochondria, subdivided myofibrils with Z lines, and irregular arrangements of myofilaments. In addition, aggregations of dilated sarcoplasmic reticula and a honeycomb structure were occasionally recognized in the lesions. Nuclear membranes and plasma membranes of the myocytes were sometimes invaginated. The ring fibers were composed of two types of myofilaments with A and I bands, Z and M lines. These myofibers were normal in structure, but the direction deviated from the usual pattern. The ring fibers often coexisted with sarcoplasmic masses with a single muscle fiber.

The morphological changes observed here are similar to those of human myotonic dystrophy. It is suggested that the difficulty in lifting the wings was attributable to the lesions in the superficial pectoral muscles, internal and external coracobrachial muscles, and muscles of the brachium.

This strain of quail is suitable as a model for the investigation of myotonic dystrophy in human and animals.