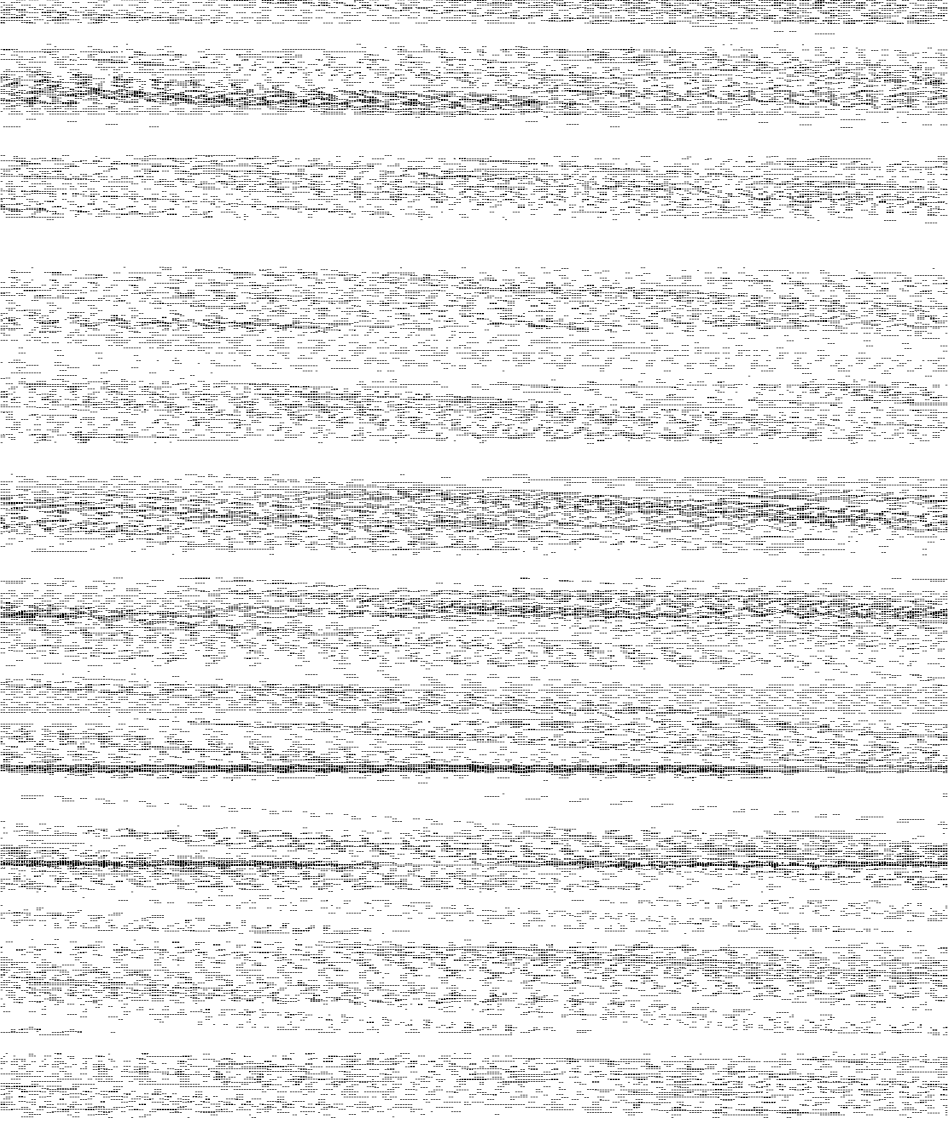
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不同。膈肌是主要的呼吸肌,有不同于共它骨骼肌的特殊功能要求,除快速收缩外,还必须有持续、耐久的收缩能力。结果表明,大鼠膈肌既含较高比例的快收缩纤维(Ⅱ A+Ⅱ B,DIcos 和 DIcru 分别为66.8%和74.7%),又保持了较高比例的氧化型纤维(Ⅰ+Ⅱ A,DIcos和 DIcru 分别为60.1%和48.4%)。肢体肌 TAde 为快收缩肌,Ⅱ型纤维比例高达91.1%,SOL 与维持身体姿式有关,为慢收缩肌,不含Ⅱ B 纤维,Ⅰ型纤维比例为84.3%,说明肌肉的纤维构成与其功能要求有关。

膈肌过去被认为是单一的功能实体,但近些年的研究表明,DIcos 和 DIcru 在发育、解剖和功能上均有很大差别[1,7,8],故认为是两块不同的肌肉。本实验结果表明,两膈肌纤维构成比例有差异,DIcos Ⅰ型纤维比例(33.2%)高于 DIcru(25.3%),而 DIcru 的Ⅱ B 纤维(56.4%)高于 DIcos(39.9%),说明 DIcos 的氧化能力高于 DIcru。DIcos 和 DIcru 在呼吸运动中的作用不同,DIcos 收缩时胸廓下部扩张,起吸气作用,而 DIcru 相反,收缩时胸廓下部缩小,起呼气作用[7]。两者功能不同决定了其结构和代谢的差异。我们也观察到,DIcos较 DIcru 有更高的氧化酶活性(待发表),直接说明了两膈肌氧化代谢能力不同。

参考文献

1 Troyer AD, Sampson M, Sigrist S et al. The diaphragm: two muscles. Science,1981;213:237

2 Lind A, Kenell D. Myofibrillar ATPase histochemistry of rat skeletal museles; A two-dimentional quantitative approch. J Histochem,1991;39(5):589

3 Green HJ, Plyley MJ, Smith DM et al. Extreme endurence training and fiber type adaption in rat diaphragm. J Appl Physiol,1989;66(4):1914

4 Gorza L. Identification of a novel type 2 fiber population in mammalian skeletal muscle by combined use of histochemical myosin ATPase and anti-myosin monoclonal antiboies. J Histochem,1990;38(2):257

5 Hamalainon N, Pette D. The histochemical profiles of fast fiber types Ⅱ B, Ⅱ D, and Ⅱ A in skeletal muscles of mouse, rat, and rabbit. J Histochem Cytochem,1993;41(5):788

6 Pette JB, Barnard RJ, Egerton VR et al. Metabolic profiles of three fiber types of skeletal muscle in genea pigs and rabbits. Biochem J,1972;11(14):2627

7 Farkas GA, Duolley F, Rochester F. Functional characteristics of canine costal and crural diaphragm, J Apple Physiol,1988;65(5):2253

8 Sugiura T, Morita S, Morimoto A et al. Regional differences in myosin heavy chain isoforms and enzyme activities of the rat diaphragm. J Appl Physiol,1992;73(2):506

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Classification and histochemical study of muscular fibers of the diaphragm in rats

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Abstract The types and compositions of the muscular fibers of the diaphragm of rats were studied with myosin ATPase histochemistry. In the costal and crural parts of the diaphragm, the muscular fibers could be classified into Type Ⅰ, Type Ⅱ-A and Type Ⅱ-B. The percentage of Type Ⅰ, Type Ⅱ-A and Type Ⅱ-B fibers in the costal diaphragm was 33.2%±5.3%, 26.9%±4.7% an 39.9%±13.8% respectively and that in the crual diaphragm was 25.3%±6.7%, 23.1%±5.5% and 51.5%±17.2% respectively. These facts indicate that the fiber compositions are different between the costal and crural parts of the diaphragm which is possibly related to the different functions of the 2 parts of the iaphragm.

Key wors diaphragm; muscular fiber type;

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