Profile of circulating microRNAs in fibromyalgia and their relation to symptom severity: an exploratory study.

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Abstract

Fibromyalgia (FM) is characterized by generalized chronic pain and reduced pain thresholds.
Disturbed neuroendocrine function and impairment of growth hormone/insulin-like growth factor-1 is common.
However, the pathophysiology of FM is not clear.
MicroRNAs are important regulatory factors reflecting interface of genes and environment.
Our aim was to identify characteristic microRNAs in FM and relations of specific microRNAs with characteristic symptoms.
A total of 374 circulating microRNAs were measured in women with FM (n = 20; median 52.5 years) and healthy women (n = 20; 52.5 years) by quantitative PCR.
Pain thresholds were examined by algometry.
Pain [fibromyalgia impact questionnaire (FIQ) pain] levels were rated (0-100 mm) using FIQ.
Fatigue (FIQ fatigue) was rated (0-100 mm) using FIQ and multidimensional fatigue inventory general fatigue.
Sleep quantity and quality (1-4) rated from satisfactory to nonsatisfactory.
Higher scores indicate more severe symptoms.
Eight microRNAs differed significantly between FM and healthy women.
Seven microRNAs, miR-103a-3p, miR-107, let-7a-5p, miR-30b-5p, miR-151a-5p, miR-142-3p and miR-374b-5p, were lower in FM.
However, levels of miR-320a were higher in FM. MiR-103a-3p correlated with pain ($r = 0.530$, $p = 0.016$) and sleep quantity ($r = 0.593$, $p = 0.006$) in FM.
MiR-320a correlated inversely with pain ($r = -0.468$, $p = 0.037$).
MiR-374b-5p correlated inversely with pain threshold ($r = -0.612$, $p = 0.004$).
MiR-30b-5p correlated with sleep quantity ($r = 0.509$, $p = 0.022$), and let-7a-5p was associated with sleep symptoms.
When adjusted for body mass index, the correlation of sleep quantity with miR-103a and miR-30b was no longer significant.
To our knowledge, this is the first study of circulating microRNAs in FM.
Levels of several microRNAs differed significantly in FM compared to healthy women.
Three microRNAs were associated with pain or pain threshold in FM.