

大黃甘草湯は便秘症の腸内細菌叢の状態下で 下剤効果を発揮する

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Daiokanzoto (Da-Huang-Gan-Cao-Tang) is an effective laxative in gut microbiota associated with constipation

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ABSTRACT: Interindividual differences affect the purgative activities of sennoside A (SA) and Daiokanzoto (Da-Huang-Gan-Cao-Tang, DKT). In this study, we manipulated gut microbiota in mice to establish laxative responders and non-responders by feeding them a high-carbohydrate, a high-fat or a high-fibre diet. To assess the relationship between laxatives and gut microbiota, we monitored the gut microbiota before and after administering laxatives. Twenty mice per diet were divided into four groups of five mice to evaluate purgative activities of four laxative preparations, DKT, SA, SA plus rhein 8-*O*- β -D-glucopyranoside (SA+RG), and SA plus liquiritin (SA+LQ). Gut microbiota changes were monitored by next-generation sequencing of 16S rRNA gene amplicons. In high-carbohydrate and high-fat diet-fed mice, DKT exerted a significantly higher purgative activity than SA alone, and RG contributed to this activity. DKT and SA+RG administration increased the Enterobacteriaceae content of gut microbiota, which was associated with an increased purgative activity. In contrast, DKT activity was significantly suppressed by high-fibre diet. Hence, diet-induced differences in gut microbiota determined the effect of DKT, which is interesting, considering that Oriental medicines are formulated for a specific functional state or "pattern". These results demonstrated that the purgative activity of anthranoid laxatives is susceptible to diet-induced alterations in gut microbiota.

抄録 大黃甘草湯における下剤効果の個人差（レスポンダー・ノンレスポンダー）は、食習慣による腸内細菌叢の違いが影響を及ぼすと考え、下剤効果と腸内細菌叢の変化について検討した。その結果、便秘症患者と腸内細菌叢が類似している高炭水化物および高脂肪飼料摂取下の腸内細菌叢において大黃甘草湯の下剤活性は促進され、その効果は大黃のアントラキノン成分である rhein 8-*O*- β -D-glucopyranoside (RG) が Enterobacteriaceae を増加させることで発揮する作用であることを明らかにした。一方で、高食物繊維飼料摂取下の腸内細菌叢において、大黃甘草湯の下剤効果は反対に抑制された。一般的に食物繊維の摂取により腸内環境は整えられ便通は改善することから、その

ような状態では大黃甘草湯が適応しない、すなわち大黃甘草湯の証ではないと推察された。本研究によって、食餌による腸内細菌叢の違いが漢方薬のレスポonderとノンレスポonderを生み出す一因になることが明らかとなった。