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学位の種類	博士 (医学)
報告番号	甲第2024号
学位記番号	第1429号
氏名	佐藤 怜央
授与年月日	令和6年3月22日
学位論文の題名	<p>Clinical impact of skeletal muscle mass change during the neoadjuvant chemotherapy period in patients with gastric cancer: An ancillary study of JCOG1002 (進行胃癌患者における術前化学療法期間中の骨格筋量変化による臨床的影響: JCOG1002 試験の附随研究)</p> <p>World Journal of Surgery, Published online 18 December, 2023</p>
論文審査担当者	主査: 片岡 洋望 副査: 村上 英樹, 河合 憲康

Title: Clinical impact of skeletal muscle mass change during the neoadjuvant chemotherapy period in patients with gastric cancer: An ancillary study of JCOG1002

Abstract

Background: Recent investigations have indicated a correlation between sarcopenia and postoperative complications as well as unfavorable prognoses. Despite the potential efficacy of neoadjuvant chemotherapy in treating gastric cancer, its adverse effects may result in the reduction of skeletal muscle mass. This research aims to examine changes in skeletal muscle mass during neoadjuvant chemotherapy and evaluate its clinical implications for patients with locally advanced gastric cancer.

Methods: Fifty patients who completed two courses of neoadjuvant chemotherapy followed by surgery were included. Skeletal muscle mass was measured using computed tomography images before and after chemotherapy. The proportion of skeletal muscle mass change (%SMC) during neoadjuvant chemotherapy and its cutoff value was explored using the receiver operating characteristic for the overall survival of patients undergoing R0 resection. Risk factors of skeletal muscle mass loss were also evaluated.

Results: Overall, 64% of patients had skeletal muscle mass loss during neoadjuvant chemotherapy (median %SMC -3.4% ; range: -18.9 to 10.3%). Multivariable analysis identified older age (≥ 70 years) as an independent predictor of skeletal muscle mass loss (mean [95% confidence interval]: -4.70% [-8.83 to -0.58], $P = 0.026$). Among 43 patients undergoing R0 resection, %SMC $< -6.9\%$ was an independent poor prognostic factor for overall survival (hazard ratio, 11.53; 95% confidence interval, 2.78–47.80) and relapse-free survival (hazard ratio 4.54, 95% confidence interval 1.50–13.81).

Conclusions: Skeletal muscle mass loss occurs frequently during neoadjuvant chemotherapy for locally advanced gastric cancer and could adversely affect survival outcomes.