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TITLE: Long-Term Follow Up of Osteosarcoma Outcomes in Patients Receiving Neoadjuvant-Adjuvant Chemotherapy compared to Adjuvant Chemotherapy Alone

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ABSTRACT (upto 300 words)

Osteosarcoma is the most common primary malignancy of bones in childhood and adolescence. The overall 5-year survival rate for patients with localized, high-grade osteosarcoma was <20%. Today, with modern multimodality therapy combining systemic chemotherapy and advanced surgical resection, the cure rate for this patient population exceeds 70%.

The purpose of this systematic review & meta-analysis is to assess the long-term association between the type of chemotherapy treatment and the rates of recurrence, metastasis, and death. We also assessed the long-term Event Free Survival (EFS) and Overall Survival (OS) of osteosarcoma patients.

Fourteen studies with an average follow-up duration of 16.17 years (range: 1-22.1 years) were included (n=1,009 patients [males n=610, 60.45%; average age: 17.69 (8 months-79 years)]). The meta-analysis demonstrated that recurrence is less common in the adjuvant compared to the neoadjuvant-adjuvant treatment group [3% (1-7%) vs. 11% (1-29%), *p*-value <0.01], metastasis is more common in the adjuvant compared to the neoadjuvant-adjuvant treatment group [16% (11-22%) vs. 15% (0-56%), *p*-value <0.01].

The relative risk (RR) of recurrence in the adjuvant group compared to the neoadjuvant-adjuvant group is 0.27 (CI: 0.11-0.61); odds ratio (OR) of 1.74 (CI: 0.10-0.57); and *p*-value <0.01. The RR of metastases in the adjuvant group compared to the neoadjuvant-adjuvant group is 2.59 (CI: 1.09-2.31); an OR of 1.74 (CI: 1.10-2.73); and a *p*-value=0.02. The RR of death in the adjuvant group compared to the neoadjuvant-adjuvant group is 1.83 (CI: 1.47-2.28); an OR of 2.59 (CI: 1.81-3.69); and a *p*-value <0.01.

Our study has shown that treatment of osteosarcoma with surgery and adjuvant chemotherapy alone is associated with higher rates of metastasis and deaths but lower rates of recurrence in contrast to treatment with neoadjuvant, surgery, and adjuvant chemotherapy.



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BIOGRAPHY (upto 200 words)

Abdelrafour Houdane is a medical intern from Alfasal University pursuing orthopaedic surgery with a passion for research, medical education and improving access to surgical care in underrepresented communities. His primary research focus is orthopaedic oncology, pediatric orthopaedics, trauma and arthroplasty.

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