Research Article

INTERNATIONAL RESEARCH JOURNAL OF PHARMACY

www.irjponline.com ISSN 2230-8407 [LINKING]

EVALUATING CLINICAL OUTCOMES OVER LONG TERM RESULTS FOR BONE AND SOFT-TISSUE SARCOMAS

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How To Cite: Singh LK, Reddy PV. Evaluating Clinical Outcomes Over Long Term Results For Bone And Soft-Tissue Sarcomas. International Research Journal Of Pharmacy, 2021,12:11:18-21.
DOI: 10.7897/2230-8407.1211172

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ABSTRACT

Background: Despite being rare, sarcomas are very difficult to diagnose and treat, requiring a multidisciplinary approach by surgeons, pathologists, radiologists, and/or oncologists.

Aim: The goals of this clinical trial were to investigate the treatment and prognosis of various sarcomas, including Ewing, chondrosarcoma, soft tissue, and osteosarcomas.

Methods: At baseline, 225 sarcomas' tumour characteristics and the demographics of all research participants were recorded. Osteosarcoma and Ewing sarcoma tumour necrosis after surgery was evaluated histopathologically. After the material was reviewed, conclusions were made.

Results: Following a 2-year follow-up, the mean event-free survival and disease survival for osteosarcoma were 46 (41–53) months and 53 (47–57) months, respectively. The disease-free and overall survival rates for Ewing sarcoma in the metastatic group at follow-up were 33.3% (n = 5) and 66.6% (n = 10) respectively. The overall survival rate for soft-tissue sarcoma cases was 63.26% (n=31) and 38.77% (n=19) patients at two recall intervals, respectively.

Conclusion: The current study concluded that chemotherapy results in better clinical outcomes for sarcomas, including soft-tissue sarcoma, osteosarcoma, chondrosarcoma, and Ewing sarcoma, taking into account its limitations.

Keywords: Chondrosarcoma, Ewing Sarcoma, Osteosarcoma, Soft Tissue Sarcoma, Interdisciplinary Management

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INTRODUCTION

It is quite rare for sarcomas to primarily attack the soft tissues and bones. These kinds of sarcomas account for less than 1% of adult cancers. Sarcomas are rare tumours, yet they can be challenging to diagnose and treat. Thanks to this interdisciplinary approach, patients with soft tissue and bone sarcomas—which were once assumed to be fatal—have a higher disease-free survival rate. Osteosarcomas are believed to be the most common malignant tumour affecting bone in growing skeletons among bone sarcomas.[1]

Both extreme surgical excision and intensive multiagent chemotherapy are used in their treatment. International guidelines for multiagent chemotherapy prescribe doxorubicin, cisplatin, and a third drug, which may be high-dose methotrexate (HDMTX) or ifosfamide. After osteosarcoma, ewing sarcoma is the second most prevalent bone cancer in young adults and teens; it is more common in Caucasians than in Asians. However, there are a lot of occurrences of Ewing sarcomas in Indians due to their incredibly dense population.[2]

The third most common bone cancer to be detected, chondrosarcomas are treated surgically due to their resistance to radiation and chemotherapy. With the possible exception of mesenchymal and dedifferentiated tumours, which can benefit from adjuvant chemotherapy, chemotherapy is equally unsuccessful in cases of chondrosarcoma.[3]

Soft tissue sarcomas are heterogeneous groups of carcinomas originating from different mesenchymal cells, with differing histologic subtypes. Mesenchymal cells from a range of origins, such as adipose tissues, fibroblasts, muscles, arteries, and/or nerves, make up more than seventy different types of soft tissue sarcomas of different stages and

grades. Preserving the limbs and their usefulness is the main objective of treatment and care for high-grade soft tissue sarcomas affecting the extremities.[4]

The many forms of sarcomas, their treatments, and the clinical outcomes were all investigated in the ongoing clinical trial. The study looked at the clinical outcomes and management strategies for osteosarcoma, chondrosarcoma, soft tissue sarcomas, and Ewing sarcomas, as well as each kind of sarcoma alone.

MATERIALS AND METHODS

In 2020–2021, the experiment was conducted at the Department of General Surgery. A total of 250 patients with soft tissue or bone sarcomas were included in the research. The study sample consisted of both males and females in the age range of 21 to 67, with a mean age of 38.4 years. The trial was performed following the approval of the protocol and informed consent. The study made use of prospective data that was retrieved from the institutional records. Every patient had a thorough radiological and clinical examination before starting treatment. The study did not include female participants who chose not to participate or who were pregnant or breastfeeding.

Using MRI (Magnetic Resonance Imaging) and radiography of the sarcoma-affected region, each of the 250 subjects with primary bone sarcomas was assessed. To assess the staging and metastasis, a CT (Computed Tomography) scan of the thorax was carried out in addition to a bone scan. The Ewing sarcoma metastasis was evaluated using PET-CT imaging. Bone, CT, or PET scans were used to determine whether chondrosarcomas were present.

Additional testing, such as creatinine levels, audiometry, ECG (echocardiography), liver function tests, renal function tests, and total blood counts, were performed on each research participant to evaluate the functioning of their organs. All research participants' demographic data, including age, gender, and socioeconomic status, was recorded at baseline. Nutritional indicators such body mass index (BMI), vitamin B12, transferrin-saturated folate levels, haemoglobin, and albumin were noted. To assess the staging and metastasis, a CT (Computed Tomography) scan of the thorax was carried out in addition to a bone scan. The Ewing sarcoma metastasis was evaluated using PET-CT imaging. Bone, CT, or PET scans were used to determine whether chondrosarcomas were present.

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The median age was 19 (range: 8–46) years for patients with metastases and 15 (range: 12-55) years for those without. For individuals with a large tumour load, nutrition was compromised. Upon histological inspection, 60.34% (n=35) of nonmetastatic tumours showed a favourable response (~90% necrosis). The mean event-free survival and disease survival were found to be 46 (41–53) months and 53 (47–57) months, respectively, after a two-year period of monitoring; however, neither overall survival nor disease-free survival could be clearly ascertained. Neutropenia was seen in 24.13% (n=14) and thrombocytopenia in 44.82% (n=26) of the patients, respectively. 52.63% (n=10) of the 19 patients in the metastatic group who were able to be assessed responded well.

The mean event-free survival and disease survival at a 50-month follow-up were found to be 14 (10–20) months and 27 (15–37) months, respectively. Neutropenia was present in 52.63% of the patients (n = 10) and thrombocytopenia was present in 47.36% of the subjects (n = 9).

Within the database, there were 57 cases of Ewing sarcoma; of these, 15 cases (26.31%) developed metastatic disease, whereas 42 cases (73.68%) did not. The overall length of the therapeutic course was 48 months (36-74 months). At follow-up, the nonmetastatic group had rates of 61.90% (n = 26) and 83.3% (n = 35) for disease-free and overall survival, respectively, compared to 33.3% (n = 5) and 66.6% (n = 10) for the metastatic group. Neutropenia was seen in 24.13% (n=14) and thrombocytopenia in 44.82% (n=26) of the patients, respectively.

Of the 19 patients in the metastatic group who could be examined, 52.63% (n=10) had good responses. The mean event-free survival and disease survival at a 50-month follow-up were found to be 14 (10–20) months and 27 (15–37) months, respectively. Neutropenia was present in 52.63% of the patients (n = 10) and thrombocytopenia was present in 47.36% of the subjects (n = 9).

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There were 69 cases of soft-tissue sarcomas with a mean age of 40 years (7-78), with most of the cases being male (62.31%, n=43). With percentages of 30.43% (n=21), 28.9% (n=20), 10.14% (n=7), and least amount of liposarcoma, respectively, synovial was the most common kind. The next most prevalent forms were pleomorphic, least liposarcoma, and spindle cell type. While 88.40% (n=61) of the individuals had no metastases, 11.59% (n=8) of the participants did. While 7.14% (n=4) of the participants had amputations, 81.15% (n=56) of the subjects had surgery followed by radiation therapy, either with or without chemotherapy, in order to preserve their limbs. For these patients, the average follow-up period was 50 months. At a 50-month follow-up, data on the clinical results in terms of disease-free survival, local control, and overall survival in 49 surviving cases were documented (Table 2).

79.59% (n=39) and 79.59% (n=39) of the individuals exhibited local control at 48 and 50 months, respectively. The overall survival rate at two recall intervals was 63.26% (n = 31) and 38.77% (n = 19), respectively. In evaluating the clinical outcomes, lung metastases were found in 48.97% of the patients (n= 24). There were six cases of local recurrence. Of those with soft-tissue sarcomas, eleven (22.44%) had both.

DISCUSSION

The many forms of sarcomas, their treatments, and the clinical outcomes were all investigated in the ongoing clinical trial. The study investigated the clinical outcomes and treatment strategies for 225 cases of osteosarcoma, chondrosarcoma, soft tissue sarcomas, and Ewing sarcomas. It looked at each kind of sarcoma independently.

The mean disease-free and event-free survival for osteosarcoma after a 2-year follow-up were 46 (41–53) and 53 (47–57) months, respectively. However, neither the overall nor the disease-free survival could be definitively confirmed. 52.63% (n=10) of the 19 patients in the metastatic group who were able to be assessed responded well. The mean event-free survival and disease survival at a 50-month follow-up were found to be 14 (10–20) months and 27 (15–37) months, respectively. During a 24-month follow-up for chondrosarcoma, the rates of disease-free and overall survival were 70% (n = 28) and 85% (n = 34), respectively. The overall survival rate for soft-tissue sarcoma cases was 63.26% (n=31) and 38.77% (n=19) patients at two recall intervals, respectively.

These results were in line with those of Malik M et al. (2005) and Bajpai J et al. (2011), who reported that, as of the current research, the survival rates in populations with dietary deficiencies were 42% and 33%, respectively. In the study, 78 individuals with osteosarcoma of the extremities were examined; of them, 25.65% (n = 20) developed metastases. There were 57 occurrences of Ewing sarcoma found in the record; of them, 26.31% (n = 15) were metastatic. Soft-tissue sarcoma metastases were seen in 11.59% (n=8) of the patients. In terms of survival and responsiveness, their results were comparable to those of Damron TA et al. (2007) and Yang ZM et al. (2012).

However, Cotterill SJ et als 2000 findings, which indicated that long-term clinical outcomes revealed a 20%–40% outcome, were directly at odds with these results. There were 57 instances of Ewing sarcoma in the database; of these, 26.31% (n = 15) had metastatic disease and 73.68% (n = 42) did not. The overall length of the therapeutic course was 48 months (36-74 months). At follow-up, the nonmetastatic group had rates of 61.90% (n = 26) and 83.3% (n = 35) for disease-free and overall survival, respectively, compared to 33.3% (n = 5) and 66.6% (n = 10) for the metastatic group. Compliance among young adults was lower. These results were in line with those of Granowetter L et al. (2011) and Womer RB et al. (2010), who also found similar results following three weeks of therapy. Lung metastases were found in 24 patients with chondrosarcoma and soft-tissue sarcoma, which was greater than the 4 out of 37 patients in Yang ZM et al in 2012 research who had lung metastases. The higher results could have been influenced by the inclusion of both mesenchymal and dedifferentiated sarcomas in this investigation.

CONCLUSION

Despite a number of limitations, the present study concluded that chemotherapy improves clinical outcomes for sarcomas, including Ewing sarcoma, osteosarcoma, chondrosarcoma, and soft-tissue sarcoma. Patients with sarcomas also show better adherence to their treatment plans. Metastatic sarcomas exhibited somewhat unfavourable clinical results. Surgical sites with well defined margins typically yield significantly better clinical outcomes. Getting interdisciplinary care is suggested.

REFERENCES

1. Mark, Rufus J., et al. "Postirradiation sarcomas. A single-institution study and review of the literature." *Cancer* 73.10 (1994): 2653-2662.
2. Malik M, Julka PK, Rastogi S, Rath GK. Neo-adjuvant chemotherapy for limb preservation in non-metastatic osteosarcoma of the extremity: AIIMS experience. J Clin Oncol 2005;23:9056.
3. Stiller, C. A., et al. "Descriptive epidemiology of sarcomas in Europe: report from the RARECARE project." *European journal of cancer* 49.3 (2013): 684-695.
4. Casali, P. G., and J-Y. Blay. "Soft tissue sarcomas: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up." *Annals of Oncology* 21 (2010): v198-v203.
5. Coindre, J. M. "Vers une classification moléculaire des sarcomes des tissus mous?." *Annales de Pathologie*. Vol. 26. Elsevier Masson, 2006.
6. Bajpai J, Kumar R, Sreenivas V, Sharma MC, Khan SA, Rastogi S, et al. Prediction of chemotherapy response by PET-CT in osteosarcoma: Correlation with histologic necrosis. J Pediatr Hematol Oncol 2011;33:271-8.
7. Damron TA, Ward WG, Stewart A. Osteosarcoma, chondrosarcoma, and Ewing's sarcoma: National cancer database report. Clin Orthop Relat Res 2007;459:40-7.
8. Yang ZM, Tao HM, Ye ZM, Li WX, Lin N, Yang DS, et al. Multivariate analysis of the prognosis of 37 chondrosarcoma patients. Asian Pac J Cancer Prev 2012;13:1171-6.
9. Cotterill SJ, Ahrens S, Paulussen M, Jürgens HF, Voûte PA, Gadner H, et al. Prognostic factors in Ewing's tumor of bone: Analysis of 975 patients from the European Intergroup Cooperative Ewing's Sarcoma Study Group. J Clin Oncol 2000;18:3108-14.

10. Womer RB, West DC, Krailo MD, Dickman PS, Pawel BR, Grier HE, et al. Randomized controlled trial of interval-compressed chemotherapy for the treatment of localized Ewing sarcoma: A report from the children's oncology group. J Clin Oncol 2012;30:4148-54.
11. Granowetter L, Womer R, Devidas M, Krailo M, Wang C, Bernstein M, et al. Dose-intensified compared with standard chemotherapy for nonmetastatic Ewing sarcoma family of tumors: A Children's oncology group study. J Clin Oncol 2009;27:2536-41.

TABLES

Characteristic	**Metastasis Cases (n=20)**		**Non-Metastasis Cases (n=58)**	
	Median %	Abnormal values %	Median %	Abnormal values %
Age Range	19 (8-46)		15 (12-55)	
Size of Tumor	10 (4-21)		9.8 (1.2-20.4)	
Alkaline Phosphatase	290 (62-2029)	36	242 (86-1218)	36
Lactate Dehydrogenase	294 (128-584)	78	232 (124-513)	78
Hemoglobin	12 (8-17)	57	12 (10-18)	42
Transferrin	13 (4.86-99)	33	18 (3-55)	23
Iron	46 (14-382)	26	53 (7-122)	58
Folate	5 (2.5-5.4)	10	7 (1-84)	5
Vitamin B12	204 (69-1500)	41	225 (35-1486)	37
BMI	18 (8.50-27)	49	17 (12-28)	63

12. Table 1: Demographic and Tumor Characteristics in Study subjects

Parameter (n=49)	**Results (At 48 months)**	**Results (At 50 months)**
Local Control	79.59% (n=39)	75.51% (n=37)
Disease-Free Survival	46.93% (n=23)	38.77% (n=19)
Overall Survival	63.26% (n=31)	57.14% (n=28)

13. Table 2: Survival in subjects with Soft Tissue sarcomas

Outcome (n=49)	**Percentage (%)**	**Number (n)**
Local Relapse	12.24%	6
Distant Metastasis	48.97%	24
Both local and distant	22.44%	11

14. Table 3: Clinical Outcomes in subjects with Soft Tissue sarcomas