soho2023
ELEVENTH ANNUAL MEETING

Correlation of CT Chest Findings With Bronchoalveolar Fluid (BAL) Analysis in Adolescent and Adult Leukemia and Lymphoma Patients With Febrile Neutropenia

Sweta Bothra MD, Meenakshi Thakur MD, Akshay Baheti MD, Amit Janu DNB, Ujjwal Agarwal MD, Hasmukh Jain MD, Jayashree Thorat MD, Manju Sengar MD, Sandeep Tandon MD, Suyash Kulkarni DNB

Tata Memorial Hospital, Mumbai, India

TATA MEMORIAL CENTRE
टाटा स्मारक केंद्र
SERVICE RESEARCH EDUCATION

INTRODUCTION

Considering the clinical settings and the radiological findings predicting the most probable etiological factor of pulmonary infection may aid in the proper management of these infections, resulting in reductions in morbidity and mortality.

AIM

To correlate computed tomography (CT) chest findings with bronchoalveolar fluid (BAL) analysis in adolescent and adult leukemia and lymphoma patients with febrile neutropenia.

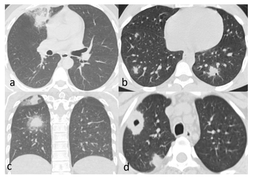
METHOD

This is an interim analysis of an IRB-approved ongoing prospective observational study. Eligible patients were > 15 years who presented with febrile neutropenia showing lung infiltrates on CT.

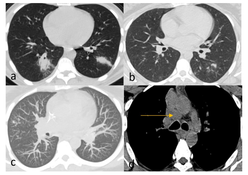
CT images were independently reviewed by two blinded radiologists for the presence of consolidatory areas, nodular opacities, ground-glass opacification, distribution pattern, cavitation, halo sign, reverse halo sign, pleural effusion, and nodal status. Then the possible causative organism was postulated, e.g., fungal , bacterial, mixed infection, and others.

RESULTS

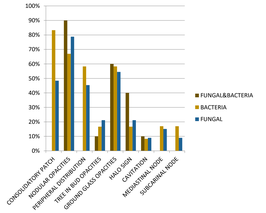
The study included 73 patients; 60 were positive on BAL. Of the 60, 33, 12, 10, and 5 patients each had fungal, bacterial, mixed fungal and bacterial, and tuberculosis (TB), respectively. No finding was found to correlate significantly with one particular infection, apart from consolidative opacities that were seen in bacterial infection (P=0.003). The 13 patients with negative BAL results mostly showed tiny nodules with ground glass opacities, without extensive lung involvement. Kappa was found to be 0.28 (poor agreement). Observer 1 had a specificity and accuracy of 77% and 67%, respectively, while observer 2 had 81% and 72%, respectively. After consensus, the specificity and accuracy were 81% and 70%, respectively.



Imaging findings in fungal infection. a) Consolidation with ground glass opacity. b) Nodules with ground glass opacity. c) Halo sign. d) Cavitation



Imaging findings in bacterial infection. a) Consolidation b) Nodules c) Tree in bud nodules. d) Mediastinal nodes



Graph showing percentage imaging features in fungal, bacterial and combined infection.

Parameters	Sensitivity (%)		Specificity (%)		PPV (%)		NPV (%)		P Value	
	F	B	F	B	F	B	F	B	F	B
Consolidation Patch	48.4	83	59.2	67	59	38	48	94	0.6	**0.003**
Nodular Opacities	79	67	18.5	17	54	17	41	67	1.0	0.23
Peripheral Distribution	45.4	58	66.6	65	63	29	50	86	0.4	0.19
Tree In Bud Opacities	21.2	17	92.6	81	78	18	49	80	.16	1.0
Ground Glass Opacities	54.5	58	37	62	51	28	40	86	0.6	0.2
Halo Sign	21.2	17	78	77	54	15	45	79	1.0	1.0
Cavitation	9.0	8	93	92	60	20	45	80	1.0	1.0
Mediastinal Node	15	17	92	90	71	29	47	81	0.7	0.4
Subcarinal Node	9	16	92	94	60	40	45	82	0.7	0.7

Table showing different parameters diagnostic evaluation in fungal(F) and bacterial (B). PPV: Positive predictive value; NPV: Negative Predictive value

CONCLUSIONS

Overall, based on imaging findings, CT had moderate accuracy in diagnosing the possible etiological agent. There was poor interobserver agreement.

REFERENCES

1. Ghandili S, von Kroge PH, Simon M, Henes FO, Rohde H, Hoffmann A, Lindeman NB, Bokemeyer C, Fiedler W, Modemann F. Diagnostic Utility of Bronchoalveolar Lavage in Patients with Acute Leukemia under Broad-Spectrum Anti-Infective Treatment. Cancers. 2022 Jun 2;14(11):2773.
2. Khalid U, Akram MJ, Butt FM, Ashraf MB, Khan F. The Diagnostic Utility and Clinical Implications of Bronchoalveolar Lavage in Cancer Patients With Febrile Neutropenia and Lung Infiltrates. Cureus. 2020 Sep 6;12(9).
3. Marchesi F, Cattaneo C, Criscuolo M, Delia M, Dargenio M, Del Principe MI, Spadea A, Fracchiolla NS, Melillo L, Perruccio K, Alati C. A bronchoalveolar lavage-driven antimicrobial treatment improves survival in hematologic malignancy patients with detected lung infiltrates: a prospective multicenter study of the SEIFEM group. American Journal of Hematology. 2019 Oct;94(10):1104-12.

ACKNOWLEDGEMENTS

Tata Memorial Hospital, Mumbai, India

CONTACT INFORMATION

Email id: ujjwalagg8@gmail.com