**The International Atomic Energy Agency Randomized Trial on Chemotherapy With or Without Radiation Therapy in Advanced Non-small Cell Lung Cancer (NCT00864331)**

B. Jeremic,1 S. Ghosh,2 E. Fidarova,3 M. Faheem,4 J.P. Agarwal,5 F.N. Lau,6 V. Sharma,7 C. Ammar,8 A. Azmy,9 A. Forbe,10 and S. Brincat11;

*1Institute of Lung Diseases, Sremska Kamenica and BioIRC Research Centre, Kragujevac, Serbia, 2Division of Experimental Oncology, Cross Cancer Institute, Edmonton, AB, Canada, 3International Atomic Energy Agency, Vienna, Austria, 4Nuclear Medicine, Oncology and Radiotherapy Institute, Islamabad, Pakistan, 5Tata Memorial Centre, Mumbai, India, 6General Hospital, Kuala Lumpur, Malaysia, 7Department of Radiation Oncology, Charlotte Maxeke Johannesburg Academic Hospital, University of Witwatersrand, Johannesburg, South Africa, 8Institut National de Cancer Salah Azaiz, Tunis, Tunisia, 9Misr Oncology Centre, Cairo, Egypt, 10Sestre Milosrdnice Hospital, Zagreb, Croatia, 11Sir Paul Boffa Hospital, La Valetta, Malta*

**Purpose/Objective(s):** Chemotherapy (CHT) is considered the standard treatment approach in patients with advanced (Stage IIIB/IV) non-small cell lung cancer (NSCLC), while radiation therapy (RT) is frequently used in palliation in this setting. In order to optimize treatment with CHT with or without RT in this patient population, the International Atomic Energy Agency (IAEA) conducted a prospective randomized phase III trial (NCT00864331).

**Materials/Methods:** Eligible patients were randomized to receive either (Arm A) up to three cycles of platinum-based CHT or (Arm B) low-dose hypofractionated RT (10 Gy/1 fraction or 16 Gy/2 fraction given with one week split) followed by the same CHT as in Arm A. Megavoltage equipment with minimal nominal energy of 1.25 MV, SSD, or SAD at least 80 cm was used. RT planning was performed using conventional/fluoroscopic or CT simulator to encompass the primary tumor and abnormal lymph nodes with a margin of 2 cm. RT field size was not to exceed the equivalent to 200 cm2. Choice of drugs, the regimen, drug dose, and frequency of administration was left in alignment with participating institution standard treatment policies. Primary endpoint was overall survival and secondary was side-effects and health-related quality of life (HR QOL), the latter being subject of a separate abstract.

**Results:** A total of 185 patients were randomized (Arm A, n = 94; Arm B, n = 91). Using an intention-to-treat (ITT) analysis, there was no difference in overall survival with the median survival time (MST) for the two groups being 6.47 vs. 5.78 months, respectively, while the 1- and 2-year survival rates for the two groups were 32.6% and 15.6% vs. 18.5% and 6.1%, respectively (P = 0.13). The median time to loco-regional tumor progression for the two groups was 4.3 vs. 5.2 months, respectively, while 1- and 2-year loco-regional progression free survival rates were 20.0% and 8.6% vs. 11.7% and 2.7%, respectively (P = 0.52). The median time to distant progression for the two groups was 5.0 months vs. 5.2 months, respectively, while 1-year distant progression-free survival rates were 15.6% vs. 5.3% (P = 0.17). Acute high-grade (>3) CHT- and RT-related toxicity was infrequent and similar in both arms.

**Conclusion:** This study failed to show impact of palliative thoracic RT on outcome in patients with advanced NSCLC treated with CHT when given beforehand, with no difference in the toxicity between the two arms. Further studies testing this question need to take into account both novel drugs and more aggressive RT characteristics when attempting to optimize treatment approach in this setting.