

nurses who train on-the-job. Most countries do not have focused education programmes for RTTs.

Table 1: Current radiotherapy resources in post-Soviet countries, relative to cancer incidence (GloboCan-2012)

Country	Population million (2012)	Number of new cancer cases (x1000) in 2012	No. RT centres	UNACs	Co-60 machines/units	Teletherapy machines/million new cancer patients/year	Teletherapy machines/1000 new cancer patients/year	Conventional simulators	CT-TPS	BT	MD	MP	RTT	
ARMENIA	3.1	10.9	2	2	3	1.2	0.4	1	1	4	2	15	4	9
(1 n.a.)														
AZERBAIJAN	9.4	14.5	3	5	3	0.95	0.8	0	3	5	2	30	6	30
BELARUS	9.5	22.4	13	19	15	2.6	0.77	6	6	16	18	117	62	55
GEORGIA	4.3	12.4	4	5	1	1.3	0.5	1	3	3	2	18	12	21
KAZAKHSTAN	16.4	40.4	19	8	26	2.0	0.8	16	4	39	17	98	39	110
KIRGIZSTAN	5.4	5.8	1	0	2	0.3	0.3	0	1	1	0	14	5	6
(1 n.a.)														
MOLDOVA	3.5	9.9	1	1	2	0.85	0.3	1	1	3	1	21	4	12
RUSSIAN FED.	142.2	418.4	144	183	221	2.8	0.77	29	16	178	132	1215	487	1319
TAJIKISTAN	7.1	5.5	1	0	1	0.1	0.14	1	0	2	1	5	2	0
TURKMENISTAN	5.2	6.0	5	2	4	1.1	1	0	1	0	4	n.a.	n.a.	n.a.
UKRAINE	46.5	141.0	52	21	86	2.4	0.75	6	20	40	49	460	188	59
UZBEKISTAN	28.1	22.6	5	1	5	0.2	0.2	1	0	-	1	20	4	25
(n.a.)														
All countries combined	279.2	739.2	250	228	369	1.3	0.56	62	64	303	249	2019	813	1510
(sum)														
(n.a.)														
(calculated)														

TPS = 1r: planning system, BT = brachytherapy, RD = radiation oncologists, MP = medical physicists, RTT = radiation therapists, n.a.: not operational. Turkmenistan data: subject to confirmation from official sources.

Conclusions: The results indicate heterogeneity with regards to appropriate levels of infrastructure. Some countries reach (Turkmenistan) or approach (Azerbaijan, Russia, Belarus and Ukraine) 1 TT machine/1000 cancer patients/year relative to 2012 cancer statistics.

These indicators represent an approximate estimate of resource availability, but do not reflect patient access or quality of the radiotherapy services.

Teaching Lecture: Lung SCLC-How can we improve survival further with radiotherapy?

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Lung SCLC-How can we improve survival further with radiotherapy?

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Radiotherapy (RT) has always been kept, one way or another, as a part of the multidisciplinary management of small-cell lung cancer (SCLC). In 1957, a clear distinction between two categories of SCLC - limited-disease (LD) and extensive-disease (ED) - depending on the possibility of inclusion of all possible disease sites into a single radiation portal - was made. This reflects a historically recognized value of RT for treatment outcome of SCLC. Nowadays, in the era of the use of modern technologies for imaging and RT planning, the distinction between LD and ED is made on the basis of the presence of distant metastases. But still we weigh up a value and the extent of improvement of outcome with RT use separately for LD and ED.

Thoracic RT in combination with chemotherapy and prophylactic cranial irradiation (PCI) increase 3-year survival by approximately 5% each, as shown in the meta-analyses. One randomized phase III trial demonstrated also a survival advantage by PCI of 13.5% at one year for ED-SCLC. Recently, it was demonstrated in a randomized trial that the addition of thoracic RT (30 Gy in ten fractions) after any response to chemotherapy in ED-SCLC improved 2-year survival. Although all of these improvements per se are relatively small there is a wide consensus among oncologists that these treatments should be offered to SCLC patients. Additionally, these advancements in the therapy of SCLC are worth of consideration in the context of poor survival unchanged with the use of chemotherapy over the past thirty years.

What next? Could we improve survival further with radiotherapy?

Certainly, it is a room for improvement in some areas which are still under investigation as an issue of radiotherapy dose, timing, fractionation and target volumes. Current

recommendation for LD-SCLC is the use of radio-chemotherapy with early accelerated hyper-fractionated RT. However, such an approach may not be convenient and its toxicity makes it unfeasible for fragile and/or elderly patients. The use of newer RT technologies and proper selection of patients for aggressive radio-chemotherapy schedules are expected to improve treatment tolerance.

A small improvement of survival obtained with PCI may be compromised by worse quality-adjusted life expectancy in long term survivors, as the pronounced effect of neurotoxicity (NT) becomes apparent after several years. What factors should be considered for an individual patient to find a balance between benefits of prolongation of survival by the reduction in the incidence of brain metastases and the risks of short-term and long-term toxicity? Over the past fifteen years, since an influence of PCI on survival was first demonstrated, magnetic resonance imaging (MRI) has become the imaging technique of choice in patients suspected of brain metastases. This change may decrease the number of patients eligible for PCI, as MRI is more sensitive than computerized tomography in detecting brain metastases. For better understanding of the extent and severity of late NT, long-term follow-up of patients included in prospective studies is needed. Also, some attempts have been made to prevent the development of neurocognitive decline attributed to brain irradiation. Long-term outcome of such approach is awaited.

Thoracic RT and PCI obviously do not decrease the progression rate outside the thorax and brain, thus the addition of RT to sites of extrathoracic and extracerebral metastases might also merit investigation. It is in line with growing interest and increasing data that accumulate evidence on the value of RT in the treatment of oligometastatic disease for other cancers. Such an approach is being investigated in the randomized trial by the Radiation Therapy Oncology Group.

Advancements in RT technologies proved to increase survival rates in population-based studies for Non-SCLC patients. It is reasonable to expect that it is also valid for SCLC patients; better radiation volume definition prevents from geographical misses and reduces unnecessary healthy tissues irradiation.

All these issues will be discussed in detail during the lecture.

Teaching Lecture: On the need of Population-based studies of arbitrary cancer management in the elderly

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On the need of Population-based studies of arbitrary cancer management in the elderly

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Much has been said already on the complexities and unknowns in management of cancer in the elderly, by 2020 more than 50% of all newly diagnosed patients with cancer older than 65 years, >30% when >75 years and about 10% over 85 years in most European countries. Above age 65 and rising with age, about 10% of newly diagnosed cancers is a second cancer, excluding those in the same organ site [skin - basal cell carcinoma (BCC) and large bowel as well as