RADIONUCLIDE THERAPY OF NETs WITH $^{90}$Y-DOTA TATE-
first results

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The aim of this work is presentation of the first results of the therapy of NETs with $^{90}$Y- DOTA TATE (Polatom).
Somatostatin analogues

DOTA- [Tyr$^3$] octreotate (DOTATATE)
The therapy was applied in 15 patients with various NETs:

- 5 unknown origin,
- 6 pancreatic NE carcinoma,
- one pancreatic gastrinoma,
- one gut carcinoid,
- one bronchial carcinoid,
- one lung NET.
Therapy cycles

- 5 received all 4 cycles
- 3 received 3 cycles
- 3 received 2 cycles
- 4 received only one cycle.
PATIENTS

• In all of them, together with other laboratory analyses and imaging methods, scintigraphy with somatostatin analogs was performed (in 6 with $^{111}$In Octreoscan and in the other 9 with $^{99m}$Tc-Tektrotyd) and high tumor uptake (gr. III-IV) was observed.
PATIENTS AND METHODS

• The therapy was performed with 2-4.5 GBq $^{90}$Y DOTA TATE per patient per one cycle, in the slow infusion in the physiological liquid (150 ml/15 min).
PATIENTS AND METHODS

• Between the cycles, there was a time delay of 6-8 weeks.

• 30 min before the therapy, patients began receiving the infusion of amino acids (arginine and lysine) which lasted 4h.
PATIENTS AND METHODS

• Before that, all therapies with somatostatin analogs were withdrawn.

• 24h-96h after the therapy, "bremsstrahlung" whole body imaging, SPECT and particular planar images were performed with gamma camera.
PATIENTS AND METHODS

• Analysis of the "bremsstrahlung" images showed uptake of the radiopharmaceutical in the liver.

• The most of the activity was observed in the regions of the "hot spots" grade 3 and 4 (planar T/B= 1.70± 0.9, SPECT T/B=2.9 +/- 0.8) registered with previous $^{99m}$Tc Tektrotyd and/or $^{111}$In Octreoscan images.
According to our results, after the therapy, in four patients occurred progressive disease (PD - 4 with NE pancreatic carcinoma with liver mets).
RESULTS

In the majority (n=8) of patients, stable disease (SD) was registered:

- one with bronchial carcinoid and liver mets
- one with pancreatic gastrinoma
- one with NET of unknown origin and liver lung and bone mets,
- two with neuroendocrine pancreatic carcinomas with liver mets,
- one with NET of unknown origin with liver mets,
- one with lung neuroendocrine carcinoma with liver and bone mets,
- one with NET of unknown origin with bone and skin metastases,
RESULTS

- In 3 patients occurred partial remission (PR – coecal carcinoid with liver mets and 2 with NET of unknown origin with liver mets).
RESULTS

• Up to now, there were no major clinical side effects on hepatic function.

• Transient pancytopenia occurred in two patients, and impairment of kidney function in one.
Ca orig. ignota
Lung, liver and bone metastases

99mTc-Tektrotyd

90Y-DOTA TATE

D.S.
S.B.

99mTc-Tektrotyd

Pancreatic NET

90Y-DOTA TATE
99mTc-Tektrotyd
Unknown origin

R.Z.

90Y-DOTA TATE
Pancreatic gastrinoma

$^{111}$In -pentetreotide

$^{90}$Y DOTA TATE
Pancreatic neuroendocrine carcinoma

$^{111}$In-pentetreotide

$^{99m}$Tc-Sn-colloid

$^{90}$Y-DOTATATE
Bronchial carcinoid with liver metastases

$^{99m}$Tc-Sn-colloid $^{111}$In-pentetreotide $^{90}$Y-DOTA TATE
• Response was correlated with an uptake of diagnostic radiopharmaceutical, limited tumor mass and clinical appearance of the patient as well as stable hematological and biochemical function.

• The side effects of this form of therapy are not frequent, when kidney protective agent was used.
• This therapy is better tolerated than other systemic treatments (and deliver higher absorbed radiation doses to the tumor that can be achieved by external beam irradiation).
• It has been associated with symptomatic improvement and tumor regression.
CONCLUSION

Thus, according to preliminary results, treatment with $^{90}\text{Y}$ DOTA TATE is feasible method and might be useful for the management of patients with inoperable or disseminated NETs.