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Octreoscan vs. DOTATATE PET: Comparison of Krenning Scoring

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BACKGROUND: PRRT inclusion criteria uses the qualitative Krenning score to determine adequate uptake, which used planar Octreoscan in the NETTER-1 trial. With the availability of DOTATATE PET, it is unclear if the Krenning score is equivalent between the modalities.

METHODS: 156 NET patients were imaged using both Octreoscan and DOTATATE PET at the NIH. Octreoscan (planar and SPECT) and DOTATATE PET scans were graded using the Krenning score (0 = no uptake, 1 = very low, 2 = equal to or less than liver, 3 = greater than liver, 4 = greater than spleen). The size and the number of lesions were recorded in a 5-score scale as following: 1 = 1-3 sub 2 cm, 2 = multiple sub 2 cm, 3 = 2-5 cm lesions, 4 = largest lesion > 5 cm, < 5 lesions, 5 = Largest lesion > 5 cm, > 5 lesions.

RESULTS: Table 1 shows the Krenning scores for the three modalities. 27% of patients had no evidence of disease. Of patients with positive disease, 82% were Krenning 4 on DOTATATE PET, while 18% were Krenning 4 on SPECT and 11% on planar. Stratified by size and numbers, planar and SPECT visualized 70% and 100% of DOTATATE avid score 3/4/5 lesions while the visualized 13% and 30% of size 1/2 lesions.

CONCLUSION: Krenning scoring using DOTATATE PET results in a markedly higher rate of Krenning 4 patients compared to Octreoscan imaging, which is primarily due to small lesions not being detected on Octreoscan. 90% of patients on the NETTER-1 trial had Krenning 3/4 disease on planar Octreoscan imaging.

In patients with low volume disease, the majority of patients with Krenning 3/4 disease on DOTATATE PET would not have qualified for the NETTER-1 trial, and caution must be taken to apply criteria used in the NETTER-1 trial to DOTATATE PET results.

Table 1:

OVERALL			
Krenning Score	Planar	SPECT	DOTATATE
0-1	106	84	43
2	14	16	3
3	18	33	18
4	13	21	92
Patients with SSTR-expressing disease (out of 113 patients in total)			
Krenning Score			
2	13%	14%	3%
3	16%	29%	16%
4	11%	18%	82%