STEREOTAXIC PROTON THERAPY AT PNPI SYNCHROCYCLOTRON

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In 1997–2001 the regular treatments of patients by proton stereotaxic therapy were carried out – in total, 35 days of irradiation by 1 GeV proton beam. Specialists from St. Petersburg hospitals (Neurosurgery Institute and others) diagnosed and recommended patients to the Central Research Institute of Roentgenology and Radiology, where pre-irradiation preparations and observation of patients were performed in the clinic of Proton Therapy Division. Details of the proton therapy procedure are given in Ref. [1]. Dynamics of the patient's treatment since 1975 through 5 years cycles is given in Table. The exception from this rule presents 2000–2001. From Table it is seen that the number of patients threated in 1995–99 and 2000–2001 is decreased in comparing with earlier cycles (1980–1994). This can be explained by decreasing of beam time available for full physics programs including proton therapy in 1995–2001 (2000 beam hours per year in 1995–2001, 5000 hours in 1980–1994) and the limitation of the number of patients only from North-West area of Russia instead the whole Soviet Union before. From Table it is seen a marked increase of the number of patients with the prostatic cancer – 71 in 1995–2001.

The efficiency of proton therapy in 1995–2001 was on the same level as was reported in Ref. [1]. In treatment of the somatotropinomas and prolactinomas the clinical remission was stated in 80–83% of the cases. In treatment of the cerebral arteriovenous malformations (AVM) the positive effect has been achieved for 74% of patients with the AVM volume less than 8 cm^3. The complete elimination of the AVM from the blood circulation was observed in 60% of patients.

References

[1] N.K.Abrossimov, D.L.Karlin, B.A.Konnov, V.I.Lazarev, L.A.Melnikov, G.A.Riabov, and D.M.Seliverstov, PNPI High Energy Physics Division Main Scientific Activities 1971–1996, Gatchina, 1998, p. 295.

Table

Status of proton stereotaxic therapy at PNPI synchrocyclotron

Disease	1975– –1979	1980– –1984	1985– –1989	1990– –1994	1995– –1999	2000– –2001	Total number of patients
Mammary gland Cancer	44	29	20	15	13	24	145
Prostatic cancer	–	–	1	14	42	29	86
Ophthalmopathy	4	19(1)*	4	2	–	–	29(1)*
Diabetic Retinopathy	1	13	11	–	–	–	25
Pituitary Adenoma:							
a) Icenko-Cushing’s syndrome	5	18	31(1)*	31	10	1	96(1)
b) Prolacactinic	8	25	42	19			
c) Somatotropic	27	66	65(3)*	22			
d) Hormon-nonactive	5	11	9	6	3	–	34
Cerebral Malformations:							
Arteriovenous	12	83(10)*	92(19)*	150(72)*	87(38)*	27(10)*	451(149)
Arterial	2	4	–	–	–		6
Epilepsy	2	3	–	–	–		5
Total number	109	272(11)*	275(23)*	259(72)*	185(38)*	86(10)*	1186(154)*

* Repeated proton therapy