Contribution ID: **32** Type: **Proffered Papers**

The basic situation of radiotherapy in mainland China：a national survey in 2019

Wednesday 17 February 2021 11:36 (6 minutes)

Purposes: To investigate the basic situation of radiotherapy in all hospitals of mainland china and provide a basis for developing radiotherapy standard.
Methods: From Apr. 10th, 2019 to Sep. 20th, 2019, the 9th national survey on radiation oncology departments was conducted by Chinese Society of Radiation Oncology （CSTRO）of Chinese Medical Association. The investigation method was adopted with the electronic questionnaire which required the information about the staffs, devices, techniques, annual person-times of radiotherapy and the treated tumor sites.
Results: All 1463 radiation oncology departments answered the questionnaire in mainland. The number of radiation department increased rapidly from 264 in 1986 to 1413 in 2015, and steadily from 2015 to 2019 owing to the reduction of the military hospital. The provinces of Shandong, Henan and Jiangsu got the largest number of radiation department in mainland China with 180, 149 and 106 departments, respectively. A total of 29096 staffs were employed, including 14575 clinical radiation oncologists, 8940 technical therapists, 4172 physicists, and 1409 maintenance engineers. The number of radiation oncologists increased from 1715 in 1986 to 16301 in 2015, however decreased to 14575 in 2019 due to the compulsory resident program in 2015. As the report of Chinese Medical Doctor Association, the number of residents in radiation oncology were 1209, 1316, 1353 and 1365 from 2015 to 2018. All other radiation personnel raised rapidly with the decreasing ratio of physician to physicist from 9.53 in 1986 to 3.51 in 2019. The rate of senior physicist was up to 51.9% in 2019, however, the rate of senior therapist was only 33.1%. In the aspect of radiotherapy equipment, there were 2021 linear accelerators, 66 Cobalt-60 teletherapy units, 339 brachytherapy units, 5 photon or heavy ion units, 1453 X-ray simulators, and 355 CT simulators. The number of accelerator and Co-60 per million population was 1.5, lower than the 2-4 according to the WHO standard. Beijing, Shanghai, and Shandong provinces fulfilled the WHO request with 3.73, 2.54 and 2.35, respectively. Yunnan, Guizhou, and Ningxia provinces were far below the WHO requirement with less than 1. However, the number of accelerator and Co-60 per million population were 1.04 and 1.07 in the economically developed provinces like Guangdong and Zhejiang. In this survey, three-dimensional conformal radiotherapy technique, intensity-modulated radiotherapy, stereotactic surgery or stereotactic body radiotherapy and Tomotherapy were more conducted in 1272 (86.9%) radiation departments in 2019 than 70.6% in 2015, 1121 (76.6%) than 50.1%, 297 (20.3%) than 16.3%, and 38 (2.6%) than 1.1%, respectively. Only 5 department had or were going to conduct the proton or heavy ion radiotherapy. The number of patients receiving radiotherapy reached 1259602 per-year accompany with the 37.0% increase compared with 919339 per-year.
Conclusions: There is a slowly increase of radiotherapy units, personnel, and equipment in, as well as radiotherapy personnel and equipment which are far less than the requirements of World Health Organization. The disequilibrium exists in mainland China, even in the economically developed provinces

Country or Int. Organization

China

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Session Classification: Paper Session 3: Health Economics and Health Systems Research