

and number of fractions always increases efficiency. In order to maximize the logistic benefits of HDR-BT while improving patient compliance and resource sparing, various fractionation regimens are used. Fractionation and dose adjustments of the total dose are radiobiologically important factors in lowering the incidence of complications without compromising the treatment results.

Aim: To compare patient outcomes and complications using two linear-quadratic model-based fractionation schemes of high-dose-rate intracavitary brachytherapy (HDR-IC) used to treat cervical cancer.

Materials and Methods: A prospective randomized study on 318 patients, with histologically proven advanced carcinoma cervix (stages IIB-IIIIB) was enrolled in the study. All patients received External Beam Radio Therapy (EBRT) 50 Gy in 25 fractions with concurrent chemotherapy (cisplatin 35 mg/m²) followed by IntraCavitary brachytherapy using high dose rate equipment. Patients were randomised after completion of EBRT into two arms: (1) Arm 1: HDR ICRT 6.5 Gy per fraction for 3 fractions, a week apart. (2) Arm 2: HDR ICRT, 9 Gy per fraction for 2 fractions, 1 week apart. On completion of treatment, patients were assessed monthly for 3 months followed by 3 monthly thereafter. Treatment response was assessed according to WHO criteria after one month of completion of radiotherapy. The RTOG criteria were used for radiation induced toxicities. We analyzed late toxicities in terms of Rectal, Bladder, Small Bowel toxicity and Vaginal Stenosis.

Results: Acute reactions in both the groups were comparable. None of the patient developed Grade 4 toxicity in our study and no toxicity related mortality was encountered. A slightly high frequency of late toxicity was observed in 9Gy Arm patients but was not statistically significant.

Conclusion: In our setup, HDR brachytherapy at 9 Gy per fraction in two fractions is safe, effective and resource saving method with good local control, survival, and manageable normal tissue toxicity.

Cervix: Oral Abstract

Identification of T- and B-cell epitopes in HPV-16 E7 gene isolated from cervical cancer patients

**Anoop Kumar^{1,2}, Inderjit Singh Yadav³,
Rupinder Sekhon⁴, Dwaipayan Bharadwaj²,
Mausumi Bharadwaj¹**

¹Division of Molecular Genetics and Biochemistry, Institute of Cytology and Preventive Oncology, Noida, Uttar Pradesh,

²Department of Biotechnology, School of Biotechnology, Jawaharlal Nehru University, ⁴Department of Gynaecology, Rajiv Gandhi Institute and Research Center, New Delhi, ³Department of Biotechnology, School of Agricultural Biotechnology, Punjab Agricultural University, Ludhiana, Punjab, India

Introduction: In India, cervical cancer is the most common cancer among females. Persistence infection with high risk human papillomaviruses (HR-HPV) is an etiological agent for cervical cancer development, especially HPV-16 is found to be exclusively high in cervical cancer cases in Indian population. The continuous expression and transforming ability of HPV E7 helps in progression of cervical cancer and other HPV related disease, which make E7 as a suitable targets for the development of therapeutic vaccines. **Objectives:** Identification of T- & B-cell epitopes HPV-16 E7 gene isolated from in cervical cancer patients.

Materials and Methods: A total of 80 cervical cancer tissue biopsies were collected and processed for DNA extraction, HPV diagnosis and genotyping. E7 gene of HPV-16 positive samples were amplified and sequenced. Epitopes in E7 gene sequence were predicted by online freely available tools.

Results: In the present study we got 72 samples (90%) were positive for HPV and out of which 68 samples (94.4%) were positive for the HPV-16. HPV-16 positive samples were sequenced and translated. IEDB server was used for epitope analysis; 12 potent epitopes for the MHC-I alleles were identified in isolated E7 gene of HPV-16. The most potent epitopes were MHGDTPTLHEYM for HLA-C*07:01; LLMGTLGIVCPI for HLA-A*02:01 and MHGDTPTLHEYML for HLA-C*07:01; having percentile rank 0.2 for all three and antigenicity score of 0.20011, 0.15358 and 0.10735, respectively.

Conclusion: This is an effective strategy to design immuno-therapeutics and therapeutic vaccine against HPV using E7 as target. These findings will be helpful in the development of effective vaccine for particular geographical region.

Cervix: Oral Abstract

Role of interstitial brachytherapy using template (mupit) in locally advanced carcinoma cervix

**Ashish Bhange, Abhishek Gulia, Anirudh Punnakal,
Anil Kumar Anand, Anil Kumar Bansal,
Ch. Kartikeshwar Patro, Naveen Kumawat
Department of Radiation Oncology, Max Cancer Centre,
Max Super Speciality Hospital, New Delhi, India**

Introduction: Locally advanced carcinoma cervix includes stages IIB, IIIA, IIIB and IVA. Interstitial brachytherapy has the potential to deliver adequate dose to lateral parametrium and to vagina. Hence, it is preferable in cases with distorted anatomy, extensive (lower) vaginal wall involvement, bulky residual disease post EBRT and parametrium involvement upto lateral pelvic wall.

Aim and Objective: To determine clinical outcome and complications (acute and chronic) in locally advanced carcinoma cervix, treated with interstitial brachytherapy using template (MUPIT - Martinez universal perineal interstitial template).

Materials and Methods: This study is a retrospective analysis of 37 cases of locally advanced carcinoma cervix (stage IIB-2, IIIB-30, IVA-5), treated with EBRT (dose-median 45Gy/25#) ± concurrent chemotherapy (CCT) - Inj. Cisplatin/Inj Carboplatin, followed by interstitial brachytherapy using MUPIT from December 2009 to June 2015. Initial treatment with EBRT ± CCT was followed by interstitial brachytherapy. Under spinal anaesthesia and epidural analgesia, MUPIT application was done. Straight and divergent needles (median 26, range 19-29) were inserted to cover parametrium adequately. Needle position was verified with planning CT scan and Brachytherapy planning was done. Dose was normalized to 5 mm box surface from outermost needle with optimization of dose to OAR (Bladder, Rectum and Sigmoid colon). Prescription dose -25Gy in 5#. Treatment was delivered by Microselectron HDR using Ir192 source. Treatment fractions were delivered twice daily with min 6 Hrs. gap in-between fractions.

Results: The median duration of follow-up was 25 months. Local control was achieved in 28 patients with residual disease in 7 patients and local recurrence in 2 patients. 10 patients had acute lower GI toxicity {Grade 1 (n=6), Grade 2 (n=4)}, 2 patients had acute Grade 1 bladder toxicity. 1 patient had grade 3 and 1 patient had grade 4 chronic bladder toxicity. Chronic rectal toxicity was seen in 10 patients {Grade 2 (n=4), Grade 3 (n=4), Grade 4 (n=2)}.

Conclusion: Local control was achieved in 28/37 patients (75.6%) and overall survival rate of 81.1% at median follow up of 25 months in patients with locally advanced carcinoma cervix and unfavorable prognostic factors.

Cervix: Oral Abstract

Pattern of distant metastases in treated cases of carcinoma cervix : An analysis

**Ashok K. Chauhan, Paramjeet Kaur, Anil Khurana,
Yashpal Verma, Nupur Bansal**

**Department of Radiotherapy, Pt BDS PGIMS, Rohtak,
Haryana, India**

Aims: To analyze pattern of distant failure, site of metastases, number of metastases and duration in patient with carcinoma of cervix treated with concomitant chemoradiation.

Materials and Methods: From May 2011 to December 2015, 73 patients of carcinoma cervix who treated with radical treatment (concomitant chemoradiation followed by 3 session of HDR brachytherapy) with distant metastases presented at Department of Radiotherapy-II, Pt BDS PGIMS, Rohtak were evaluated retrospectively.

Results: Most of the female with metastases were in age group of 50-59 years (82%), 12% were in age group >60 and 6% were in < 50 year age group. Initial stage of presentation was 40% (29/73), 48% (35/73) and 12% (9/73) in stage II, III and IVA respectively. Out of which 93% had squamous cell carcinoma histology and 7% were having adenocarcinoma at time of presentation. Among them 49/73 (67%) had solitary metastases, 19/73 (26%) had two metastatic sites and 5/73 (7%) had multiple metastatic sites. Commonest site of distant metastases was paraaortic lymphnodes in 40% of cases, followed by liver, lungs, brains, cervical lymph nodes and one case of cutaneous metastases was also seen. Paraaortic lymphnodes, liver and lung metastases