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Letter to Editor

Anatomy Section

Correspondence: Abnormal Nuclear Variations in Response to Radiotherapy: As a Tool in Treatment Planning and Assessment of Prognosis

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Sir,

In the article by Ravi KS, authors aimed to establish relationship between nuclear changes and dose of radiation which further could be used to predict the response of tumour to the radiotherapy and concluded that the progressive increase in Micronucleus (MN) and Multinucleation (MNU) indices with increasing dose of radiation proves that these parameters can be used as indicators for assessing the response of tumour to radiotherapy [1].

The topic is not the first of its kind. Other similar studies were done previously; the newest in the study was that, it compared the nuclear alteration in tumour cell itself for assessing the radio sensitivity, while most of the previous studies were assessing those changes in normal adjacent tissue. Authors of the study are professional of the department of anatomy, biochemistry and radiotherapy making the study multidimensional.

Since 50 patients were used for study and samples of oral mucosa were taken on day 0, day 2, day 7, day 12, and day 30 from same subjects, it seems that study was longitudinal rather than cross-sectional. Authors had not mentioned how the radiotherapy was given. It is important because two different methods of radiotherapy (brachytherapy and teletherapy) differ in exposure level for that tissue. Study by Samea showed that brachytherapy allows a higher concentration of radiation directly into the lesion. It provides significantly lower doses to surrounding normal tissues, which allows lower dose, less morbidity and fewer side effects [2]. How the samples were taken? Was it probability method of sampling or not? So, it was not mentioned whether the result can be translated for general population of oral squamous cell carcinoma or not.

Authors did not involve age, gender and smoking history of the subjects to analyse the frequency of nuclear alteration which might play an important role in determining the radio sensitivity of the tumour mass. Study done by da Cruz AD et al., concluded that increases in MN frequencies were most strongly correlated with the dose of ionizing radiation, but age, alcohol consumption, and smoking habits also affected micronucleus frequencies [3]. Study by Maffei F et al., showed that MN frequency was found to increase with age and found more in female as compared to male [4].

Da of Rt.	Rt Dose (GY)	MN Count/500 cells		NB count/500 cells		MNU count/500cells	
		Mean ±SD	Degree rise%	Mean ±SD	Degree rise%	Mean ±SD	Degree rise%
0	0	49.32± 6.251	--	41.24± 33.04	--	34.08± 3.99	--
2	4	70.52± 6.923	42	33.04± 5.357	-16	49.48± 4.704	30
7	14	81.30± 5.072	22	39.64± 5.587	12	80.02± 5.587	62
12	24	92.30± 3.824	22	52.40± 4.549	26	8.26± 4.549	18
30	60	82.52± 3.190	-20	65.00± 6.286	26	43.88± 6.286	-90

[Table/Fig-5]: Showing % rise in nuclear abnormalities.

Very high SD (41.24±33.04) for Nuclear Budding (NB) count before treatment was not explained in [Table/Fig-5].

Author mentioned that 'proforma was prepared in order to record the history and general physical examination in respect of each case' but there was no statement stating about those records. Though review of previous literature showed that even handedness and blood group also had relationship with the frequency of MN [5,6].

Study by Miyakawa A et al., showed that radiosensitivity of tumours varies with various tumour and patient-related factors. These include histology, grade of differentiation and size of tumours, and haemoglobin levels in patients. The authors of this article did not mention about the grade of tumour, size of the tumour and haemoglobin level [7].

In the [Table/Fig-5] degree rise percent was calculated by ratio of difference in mean count of two successive radiation doses and mean count before radiotherapy multiplied by 100. The values matched for MN counts but did not match when derived for NB and MNU counts.

For example for the degree of % rise of MN count, it can be calculate as follows.

At 4 Gy: [(70.52-49.32)/49.32]*100= 42.98

At 14 Gy: [(81.30-70.52)/49.32]*100=21.85

At 24 Gy: [(92.30-81.30)/49.32]*100=22.30

At 60 Gy: [(82.52-92.30)/49.32]*100= -19.82

If we calculate same for NB count and MNU the values come to be different than that of values presented in table by authors.

For NB count	For MNU count
At 4 Gy: -19.88	At 4 Gy: 45.18
At 14 Gy: 16.0	At 14 Gy: 89.61
At 24 Gy: 30.94	At 24 Gy: 27.11
At 60 Gy: 30.55	At 60 Gy: -133.15

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AUTHOR'S REPLY

The comment is well appreciated as it mirrors an interest in our work. We do not claim that our topic is the first of its kind but certainly, we have done the study with a different aim in mind, serial sampling at different days was done to assess. The study aimed to assess the effect of radiotherapy on the tumor cells in the form of nuclear changes in these cells and based on the extent of change to establish the relationship between nuclear changes with radiation dose and to investigate the prospect of utilizing them as an assay to predict tumor response to radiotherapy in oral cancers. We have not assessed the relationship of tumor with included previous history of smoking or type/ dose of radiation.

This study no doubt an observational study, one parameter is fixed i.e. the patient is suffering from oral carcinoma and the other is exposure to radiotherapy. This can be conceded that labeling it as cross-sectional was a typographical error and the table with percentage degree rise does seem to have an error in calculation, the author stands corrected here. This has been mentioned by the authors that, since the study was done in a limited number of cases due to time constraint so the translation for the general population is not mentioned but certainly based on the results we may do so and take the study of a greater population for its authentication. Lastly, we would like to thank the commenter's interest in our article and gratitude for providing us an opportunity to improve.