

# RADIOSENSITIVITY OF EPIDERMOID CARCINOMA CERVIX

BY

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It is an intermediary report on our work in the radiosensitivity of epidermoid carcinoma of the cervix based on histopathological study of 425 cases. The stratified squamous epithelia of the cervix have been studied:

- (1) In normal condition.
- (2) In epidermoid carcinomatous condition before any treatment.
- (3) In epidermoid carcinomatous condition after 7,000, 14,000, 21,000, of radium.

For proper assessment, we have classified normal and epidermoid carcinomatous cell into following biological phases as done by Glucksmann.

1. Resting phase—Phase of cell-growth.
2. Mitotic phase—Phase of cell-division.
3. Differentiating phase—Phase of cell-function.
4. Degenerating phase—Phase of cell-degeneration.

Cells in resting and mitotic phases

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are not with any function, they are in preparatory-phase for adopting mature differentiating condition by increasing their sizes and numbers. Cells in differentiating phase are really serving the body by their function.

## Materials.

Stratified squamous epithelia from 56 normal cervixes were collected from Chittaranjan Seva Sadan and 369 cases of epidermoid cancer of the cervix were recruited from Chittaranjan Cancer Hospital.

Table I gives the following data:

TABLE I

	Normal cervix	Epi. carcinoma cervix
No. of cases	56	369
Resting phase	48.9%	86.3%
Mitotic phase	0.9%	5.5%
Diff. phase	47.7%	3.2%
Deg. phase	2.5%	7.5%
Preparatory phase (resting & mitotic)	49.8%	89.5%
Wastage (Prep. Diff.)	2.1%	86.3%

In normal cervix, for 49.8% (resting 48.9% and mitotic 0.9%) there are 47.7% functioning cells. Retention wastage is only 2.1%. In unirradiated epidermoid carcinoma cervix, for 89.5% preparatory cells (resting 84% and mitotic 5.5%) functioning cells (differentiating) are only 3.2%. Hence retention wastage is 86.3%.

Table II shows the results of the study of above phases in epidermoid carcinoma in pre-radiation condition (369 cases) and post-radiation condition, i.e. an exposure of 7,000, of radium (162 cases), 14,000 of radium (125 cases) and 21,000, mgm. hrs. of radium (62 cases).

TABLE II

	Pre-radiation epi. ca-cervix	After 7000, radium in epi. ca-cervix	After 14000, radium in epi. ca-cervix	After 21000 radium in epi. ca-cervix
Total cases ..	369	162	125	62
Cancer - positive ..	100%	88.9%	34.4%	9.7%
Cancer - negative ..	0%	11.1%	65.0%	90.3%

*Mean % of Different Phases of ca-cells in  
Cancer Positive cases.*

Resting	84%	15.7%	14.1%	38.9%
Mitotic	5.3%	1.9%	1.1%	1.7%
Differen- tiating	3.2%	5.5%	10.3%	8.4%
Degenerating	7.5%	76.9%	74.5%	51.0%

From Glucksmann's work, two significant things become apparent regarding the radiation effect on epidermoid carcinoma of the cervix:

(1) Radium effect increases dege-

nerating and differentiating cells and decreases resting and mitotic cells.

(2) A preliminary radiation on epidermoid carcinoma produces differential cellular percentages of above different phases, which are related to the prognostic value on the character of radio-sensitivity of epidermoid carcinoma cells of cervix.

Our results are practically the same as those of Glucksmann, so far as the first point is concerned, namely, an increased percentage of degenerating and differentiating cells and

a reduction of resting and mitotic cells.

On the second point, our results are different from Glucksmann as evidenced from a complete study of 62 cases. We have not found any such differential cellular population after 7,000, of final cancer positive and final cancer negative cases, so that we can give definite clearcut prediction of the radiosensitivity of cancer cells. Mean percentages of 6 cancer positive and 56 cases of negative cases after final 21,000, show no significant differences in their different cellular population after first 7,000, as shown in Table III.



TABLE III

*Pictures of Cellular Populations of  
Epi. ca-cervix after 7,000 mgm. hrs*

	Ca ( ) cases after 7000	Ca ( ) cases after 21000
Number of cases	6	56
Rest. phase	15.6%	15.8%
Mit. phase	1.9%	1.7%
Diff. phase	5.5%	6.0%
Deg. phase	77.0%	76.5%

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