Letter to the Editor

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Mediastinal Fibrosis and Radiofrequency Radiation

B.	Bruce	Hocking
K.		Joyner

Industrial Directorate Telecom Australia, Melbourne, Australia

Dr. Bruce Hocking, Dr. K. Joyner, Industrial Relations Directorate, Telecom Australia, Level 33/242 Exhibition Street, Melbourne Vic 3000 (Australia)

Dear Editor

Papandreou et al. [1] report a case of mediastinal fibrosis occurring in a radar worker and suggest there may be a relationship between the condition and his radiofrequency radiation (RFR) exposure. This is dubious for scientific and clinical reasons.

Unfortunately, Papandreou et al. do not supply details of the 'improved high-powered illuminator radar' to which their patient was exposed. However, it is our experience that such radars operate at a frequency of around 6 GHz (6×10^9 Hz). RFR at 6 GHz is not very penetrating in wet human tissues. For instance, after travelling some 7 mm (such as the chest wall), the absorbed power will be approximately one-eighth of that at the surface. After travelling about 5 cm through the lung, which is taken to be a wet tissue, the absorbed power will be reduced by a factor of less than one millionth of that at the surface. For an exposure level of 1 mW/cm², the absorbed power density at the left middle mediastinum where the fibrosis occurred would be of the order of a few nano-watts per gram of tissue. (By comparison, the present safe working limits permit up to 0.4×10^6 nW/g of tissue for an exposure of 1 mW/cm².) It is difficult to envisage how such low energy levels could have adverse effects, such as fibrosis. Studies of RFR exposure in animals have not noted fibrosis as an effect at higher levels.

Papandreou et al. imply their patient may often have entered restricted areas and been overexposed to levels well in excess of 1 mW/cm². Should this have occurred, a history of feeling warmth of the skin would likely occur; in addition clicking sounds may be heard in the ear from pulsed radar; and in repeated high exposures (over 100 mW/cm²) cataracts could appear. There is no mention of any of these in the clinical record, which argues against extensive overexposure.

Therefore, on scientific and clinical grounds, RFR exposure is unlikely to have caused the mediastinal fibrosis.

Reference

Papandreou L, Panagou P, Bouros D: Mediastinal fibrosis and radiofrequency radiation exposure: Is there an association? Respiration 1992;59:181-184.