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OBSERVER VARIATION IN MAMMARY THERMOGRAPHY: RESULTS OF A TEACHING FILE TEST CARRIED OUT IN FOUR DIFFERENT CENTERS

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To evaluate observer variation in mammary thermography, a teaching file test of 159 thermographies was worked out by 4 senology centers. The evaluation of accuracy and the K index of variability demonstrated a significant variability among centers. The reliability of thermography in senology seems to be too poor for it to be able to direct any therapeutic decision, either diagnostic or prognostic.

Thermography is a non-invasive investigative method, which continues to be fairly widely used in senography in various combinations with mammography and ultrasonography (1, 4, 7, 9). Several authors have studied its possible prognostic value in mammary carcinoma, the topic dealt with by our group. Although the data available in the literature on this subject are rather discordant (3), a possible prognostic role has emerged in several studies (2, 5, 6, 8, 10, 11-13). Our group recently carried out a study involving a number of centers which revealed substantial differences among the interpretations of the various centers and ruled out this possibility. We decided, therefore, to investigate the cause of these differences, convinced that there could be too great a variability between observers, a problem which does not appear to have been previously tackled in the literature on this method.

Material and methods

The technical team at the Center in Trieste was asked to prepare a test consisting of 159 color mammary telethermographies – frontal view only taken with an AGA 680 Telethermograph – on 6×6 cm slides, without any clinical indication as to which 72 slides corresponded to neoplastic pathologies and which 87 to benign pathologies (benign phlogoses were excluded from the outset). Radiologists of proven experience in senology, and thermography in particular, from four important breast cancer centers in Italy, took part in the test.

The thermographic classification used was the classic method proposed by French authors consisting of five classes of diagnostic importance in worsening order, in which cases from TH1 to TH3 are considered negative, and TH4 and TH5 positive.

The set of thermograms was classified by the radiologists in charge of the four centers independently of each other. The accuracy of each center was then worked out, after which the chi square test (0.95) was used to calculate the differences in the various parameters between the various radiologists. The variability between the radiologists was subsequently also calculated using the K index.

Results

The results of the accuracy study are shown in Table 1. There was considerable observed variation, with mean variability of 39 % for sensitivity, 15 % for specificity, 12 % for accuracy, and 23.5 % for the positive and 3 % for the negative predictive value.

Table 1 - Evaluation of accuracy.

	Sensitivity	Specificity	Accuracy
Center 1	85	75	75
Center 2	61	71	70
Center 3	31	92	87
Center 4	31	96	91
Mean values	52	83	81

	Predictive value of positive	Predictive value of negative
Center 1	23	98
Center 2	16	95
Center 3	25	94
Center 4	44	99
Mean values	27	95

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