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Research Article

CURRENT PROGNOSTIC FACTORS IN COLORECTAL CANCER

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ABSTRACT

Introduction: Colorectal carcinoma is one of the main causes of mortality due to neoplasia in all Western countries and with high technological development. There are 150,000 in Europe and 30,000 in Italy 5-year survival is on average 40-50%, reaching 80-90% in the early forms Approximately 80% of patients with colon cancer are diagnosed with radically resectable disease. 35% of these develop a disease recovery that in most cases (80%) occurs within the first 2 or 3 years after surgery and the prognosis varies depending on the stage of the disease at diagnosis: Stage I 90%, Stage II 70-80%, Stage III 40-65% survival at 5 years. It is important to define the prognosis of the relationship between the positive lymph nodes and the analyzed lymph nodes. .. the aim of the present study is aimed at the evaluation of histopathological parameters and biological indices with prognostic indication in the colon of the colon in relation to our experience, in order to identify stable and independent prognostic factors Materials and methods: From January 2010 to December 2017 consulted the database of the AOU "G Rodolico" University of Catania Department of medical sciences and specialists II were treated 93 cases of colon neoplasia with headquarters: in the blind 3 n cases (3.5%), colon ds n 39 cases (41.5%), transverse colon n 4 cases (4.2%), colon sn n 41cases (44.6%), sigma n 6 cases (6.2%)). . The histopathological parameters and the biological indexes examined were the histological examination of the lymph nodes, tumor markers and biological expression of tumor aggressiveness, the label index, (anti-EGF and PTEN PIC3A predictive) and (BRAF VEGF prognostic) Results: Some mutations in candidate genes such as BRAF, PIK3CA and PTEN, whose effectiveness as a predictive marker remains uncertain. they have been used as potential predictive biomarkers for both somatic (tumor) and germ (patient) DNA. The results obtained indicate that mutation rates of 35% for KRAS, 7% for NRAS, 10% for BRAF, 10% for PIK3CA, 8% for PTEN, 68% for TP53, 2% for EGFR, <2% Alterations of Germinal DNA directly affects the patient's cells and can influence factors such as bioavailability, kinetics and drug metabolism, as well as interaction with the immune system and local tissue responses. Discussion It is important to underline the centrality of the neoplastic tissue for the correct histopathological diagnosis the first aid comes from the evaluation of the tumor grading. The definition of the parameter that implies the following aspects: the type of neoplasia (papiparous muciparous, ring with castone) the degree of differentiation (formation of glands loss of polarity, invasiveness) atypical cytological mitotic activity such parameter contributes in a determined manner to perfecting the diagnostic evaluation.) Microsatellite instability status is a prognostic and predictive factor for rectal tumors. Patients with high microsatellite instability (MSI-H) have a better prognosis than those with stable microsatellites (MSS) this new parameter is still under study. (57.58) .Conclusions To improve risk stratification, it is necessary to explore prognostic factors related to tumor biology that are independent of clinical and pathological variables. finally, the new markers assume a predictive meaning in terms of survival after resection

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INTRODUCTION

Colorectal carcinoma is one of the main causes of mortality due to neoplasia in all Western countries and with high technological development. There are 150,000 in Europe and 30,000 in Italy 5-year survival is on average 40-50%, reaching 80-90% in the early forms approximately 80% of patients with

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colon cancer are diagnosed with radically resectable disease. 35% of these develop a disease recovery that in most cases (80%) occurs within the first 2 or 3 years after surgery and the prognosis varies depending on the stage of the disease at diagnosis: Stage I 90%, Stage II 70-80%, Stage III 40-65% survival at 5 years. It is important to define the prognosis of the relationship between the positive lymph nodes and the analyzed lymph nodes. The current life expectancy is increasing thanks to the contribution of molecular biology which provides a better knowledge on the risk factors of relapse, (1,2,3,4,5) With an improvement in the identification of biological parameters. and staging at the genetic, cellular and tissue level in patients with low life expectancy scores. Parameters such as tumor invasion depth, lymph node involvement are an assessment to standardize groups of patients with different prognosis and with independent variables and a neoplastic progression linked to undefined tumor-like features. For this reason, the need to identify diagnostic markers used to define the peculiar tumor characteristics for the purpose of early diagnosis. Therefore, Prognostic Markers are identified that indicate a probable disease progression, predictive markers indicating the response to treatment, and surveillance to monitor colorectal disease. (6,7,8,9,10) the molecular alterations of numerous oncogenes and tumor suppressor genes that cooperate in determining tumor transformation., In 80% of cases are sporadic. The remaining 20% is considered family-type or linked to genetic syndromes, such as familial adenomatous polyposis, associated with mutations of the APC gene (adenomatous polyposis coli), and the non-polyposic hereditary colorectal carcinoma, characterized by germinal mutations of the mismatch repair (MMR) genes, especially hMSH2, hMSH6, hMLH1 and hPMS2. These two genetic syndromes represent, respectively, less than 1% and 2-3% of all cases. (11,12,13,14,15,16) In colon carcinogenesis there are three main transformation 1) Microsatellite-related pathways: instability (MSI): microsatellites are short repeated DNA sequences normally present in the human genome. Due to specific mutations, microsatellites can become abnormally shorter or longer, making the DNA unstable. MSI is found in about 15% of sporadic cases of colon cancer, but is the main genetic alteration (> 95%) in Lynch syndrome (non-polypus hereditary colorectal carcinoma). 2) Chromosomal instability (CIN): the majority of sporadic CRC show a certain degree of CIN that, unlike MSI, is associated with severe chromosomal abnormalities, such as deletions and insertions, with activation of proto-oncogenes and inactivation of genes tumor-suppressor, as well as an euploidy or chromosomal polyploidy. Numerous genes involved in intestinal carcinogenesis undergo genetic alterations due to CIN, such as APC, TP53, KRAS, BRAF, PTEN, SRC, TGF-b, SMAD 2 and 4, as well as thymosin b-4. 3) Aberrant DNA methylation: the transcription of genes is regulated by so-called promoter sequences that regulate the binding of transcription factors to the gene of interest. (17,18,19,20,21) Methylation of the promoter sequences is a fine mechanism of gene transcription regulation, as it alters the ability of transcription factors to bind to them and to promote transcription. Abnormal hypermethylation of nucleotide sequences of promoters is common in the DNA of CRC patients. Mutations in the KRAS gene are generally found in about 40% of colorectal carcinomas. (22,23,24,25) There are contradictory data on the correlation between KRAS mutations and prognosis in this neoplasm. Mutational analysis of RAS

genes is currently indicated in patients with metastatic colorectal carcinoma for whom a treatment containing a monoclonal anti-EGFR antibody is indicated. The mutational analysis of KRAS and NRAS can be carried out with different methods and must concern at least the codons 12, 13, 59, 61, 117 and 146 of of both genes. In view of the high concordance between the mutations found in primary tumors and the corresponding liver metastases, the determination of the mutational status of RAS can be carried out indifferently on primary or metastatic tumor tissue Finally, some molecular alterations may provide important prognostic indications. With the possibility of performing the RAS test on circulating tumor DNA isolated from peripheral blood with a dedicated kit already available. Finally, BRAF mutations are present in about 10% of patients with colorectal carcinoma and are associated with an unfavorable prognosis of the disease .. the aim of the present study is to evaluate histopathological parameters and biological indices with prognostic indication in the colon of the colon in relation to our experience, in order to identify stable and independent prognostic factors.

MATERIALS AND METHODS

From January 2010 to December 2017 consulted the database of the AOU "G Rodolico" University of Catania Department of medical sciences and specialized sciences II were treated 93 cases of colon tumor: in the blind 3 n cases (3.5%), colon ds n 39 cases (41.5%), transverse colon n 4 cases (4.2%), colon sn n 41 cases (44.6%), sigma n 6 cases (6.2%)). The clinical signs that emerged in patients observed at the clinical examination were: the retrieval of blood in the stool accompanied or not by diarrhea and constipation, asthenia, malaise, rapid weight loss and anemia without apparent reasons. All the patients performed the occult blood in the stool. Digital exploration of the rectum. colonscopy. and the echo endoscopy. The virtual endoscopy that, through the digital reconstruction of the images collected by TAC and magnetic resonance. Finally, PET for detecting distant or occult metastases. Surgical treatment was with curative intent when these conditions were present: 1). Tumor size not exceeding 3 cm in diameter 2). The tumor should not occupy more than a third of the lumen circumference 3). Histological grading (G1-G2) 4). Infiltration confined to the initial layers of the under mucosis (T1 sm1 and sm2) 5). Absence of lymphatic or vascular or middle neural invasion 6). Excision considered complete by both the surgeon and the anatomy-pathologist 7). Removal performed up to middle rectum fat with a normal macroscopic margin of 10 mm, 8). Circumferentially negative surgical excision margin. The histology pathological parameters and the biological indexes examined were the histological examination of the lymph nodes, tumor markers and biological expression of tumor aggressiveness, the label index, (anti-EGF and PTEN PIC3A predictive) and (BRAF VEGF prognostic)

RESULTS

Some mutations in candidate genes such as BRAF, PIK3CA and PTEN, whose effectiveness as a predictive marker still remains uncertain. They have been used as potential predictive biomarkers for both somatic (tumor) and germ (patient) DNA. The results obtained indicate that mutation rates of 35% for KRAS, 7% for NRAS, 10% for BRAF, 10% for PIK3CA, 8% for PTEN, 68% for TP53, 2% for EGFR, <2% Alterations of

Germinal DNA directly affects the patient's cells and can influence factors such as bioavailability, kinetics and drug metabolism, as well as interaction with the immune system and local tissue responses. Another parameter identified is the quantitative study of DNA or ploidy, the methodology determines the content of DNA in tumor cells and DNA in normal cells, in the same phase of the cell cycle (G0-G1). This analysis revealed the different quantums. the neoplasm that was identified diploid in 40% of cases or aneuploid in 60% of the cases observed. The results obtained are useful if associated with other factors. The study was associated with the determination of the tumor proliferation index as markers of biological aggressiveness. Using flow cytometry or the incorporation of radioactive DNA precursors Calculating the percentage of cells in the synthesis phase or of the entire fraction of proliferating cells the data obtained associated with the previously described parameter confirmed the prognostic importance of it. Molecular genetics investigations refer to genes that regulate cell proliferation and differentiation, oncogenes and suppressor genes. The sum of all the obtained variations of these genes determines the invasiveness characteristics and the properties of the metastatisation. The results obtained indicate that the RAS oncogene is activated in 35% of cases, with mutations located in 12.13 and 61 of the codons, and correlated with venous invasion, and by the presence of synchronous metastases. The p53 suppressor gene present in 10% of cases determined in association with K ras the development of local recurrences in 30% of cases confirming itself as a sign of particular aggressiveness in 60% of positive cases. In patients who underwent surgical resection of the colon, the index of recovery of the disease locally and remotely was the serum markers for which they were inserted as prognostic factors. They have been used to identify the tumor residues after surgical treatment and in the early detection of the disease. The results obtained have seen the CEA as the most used serum marker with its elevation in 60% of cases recovering the disease, the rate of blood returned in the norm after therapeutic resection and the lack of reduction indicated the persistence of the tumor. All the new biological indexes further improve the preoperative staging indicating more real data of the spread of the disease. The results obtained have seen the CEA as the most used serum marker with its elevation in 60% of cases in the recovery of the disease, the blood rate returned to normal after therapeutic resection and the lack of reduction indicated the persistence of the neoplasm. they further improve preoperative staging by indicating more realistic data on the spread of the disease, as well as allowing the identification of local recurrences at an early stage and at a distance widening the possibilities of curative eradication. Discussion

It is important to underline the centrality of the tumor tissue for the correct histology pathological diagnosis the first aid comes from the evaluation of the tumor grading. The definition of the parameter that implies the following aspects: the type of tumor (papiparous muciparous, ring-shaped with a setting) the degree of differentiation (formation of glands loss of polarity, invasiveness) atypical cytological mitotic activity such parameter contributes in a determined manner to perfect diagnostic assessment. There are several classifications, some of which are mirror-like. To define what it refers to. A) Grade (according to Mandard) 1 No residual tumor cells 2 Occasional

residual tumor cells with marked fibrosis 3 Marked fibrosis with sparse tumor cells or in groups 4 Abundant tumor cells with low fibrosis 5 Non-tumor regression .B) Grade (according to Dworack) TRG 0: absence of regression TRG 1: minor regression: tumor mass with fibrosis less than 25% of mass, TRG 2: Moderate regression: fibrosis in 26-50% of mass residual tumor, TRG 3: Good regression: fibrosis higher than 50% of the tumor mass, TRG 4: Complete regression (absence of tumor cells, only fibrotic mass) under tumoral fibrosis has been highlighted to enhance the efficacy of this parameter (desmoplasia) whose negative prognostic significance implies a considerable capacity of the host against the tumor for which the lymphocyte infiltrate and the expression of a slow tumor growth the greater frequency of hepatic metastases in patients affected by colorectal cancer weighed down by more prognosis serious has seen the flowering of research that on the one hand identifies the parameter of venous invasiveness for tumors. (27,28,29,20,31) as an important datum for the pres of lymphatic and venous invasion then associated with the presence of groups of undifferentiated cells at the invasive margin (tumor budding) that increase the risk of early relapse. (32,33,34,35,36) An additional parameter is tumor angiogenesis, with the identification of the angiogenic factor. The correlation between tumor new angiogenesis and prognosis is carried out with immunohistochemistry using antibodies (37,38,39,40, 41) this aspect led to the subsequent synthesis of a monoclonal antibody therapy Vascular Endothelial Growth Factor (VEGF) (bevacizumab) whose administration reduces tumor new vascularization. K-ras was used as a predictor of response also for therapy with the monoclonal antibody directed against the epidermal growth factor receptor (EGFR). (42,43,44,45,46) Patients undergoing therapy monoclonal, which express an un changed K-ras, show a significant survival advantage over those with mutated K-ras, which do not benefit from monoclonal treatment. (47,48,49,50,51,52) Finally the assessment of the presence of microsatellite instability (MSI) is characterized by the difference in the number of repetitions of short DNA sequences repeated between tumor and normal tissue., (53,54,55,56) The microsatellite instability status is a prognostic and predictive factor for rectal tumors. Patients with high microsatellite instability (MSI-H) have a better prognosis than those with stable microsatellites (MSS) this new parameter is still under study (57.58,59)

CONCLUSIONS

To improve risk stratification, it is necessary to explore prognostic factors related to tumor biology that are independent of clinical and pathological variables. The definition of the "ideal" prognostic marker is soon to be realized as the studies of tumor biology, independently from the selection errors. In our opinion, they contain the answer to these needs, which resides in tissue and serum banks, with a better understanding of tumor genetics, the lymph nodes linked to the primary tumor, the disease-free interval, the number of metastases, the size of the tumor. Lesion and its characteristics, and the serum levels of carcinoma-embryonic antigen, and finally the new markers assume a predictive meaning in terms of survival after resection

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