p = 0,0033). A coloração por Picrosirius Red demonstrou colágeno mais uniformemente distribuído no GH. A imunofluorescência para colágeno tipo I revelou maior expressão no GH (80,18 ± 8,88%) em comparação ao GC (45,70 ± 7,87%; p = 0,038), indicando que o tratamento com hidrogel potencializou a maturação e a organização tecidual. **Discussão e conclusão:** Os resultados demonstraram que o uso do hidrogel funcionalizado com CTMs promoveu aceleração significativa da cicatrização de queimaduras de espessura total, com evidências de regeneração tecidual qualitativa. Observou-se redução do infiltrado inflamatório, aumento da neovascularização e melhora na organização e maturação das fibras colágenas. A menor espessura da epiderme regenerada, aliada à predominância de colágeno tipo I, indicou um processo de remodelação mais avançado, compatível com a formação de um tecido funcional e estruturalmente mais próximo ao tecido nativo. Esses achados sugerem que a aplicação do hidrogel com CTMs não apenas acelera o fechamento da ferida, como também modula positivamente as fases da cicatrização, favorecendo um reparo mais eficiente e com menor risco de fibrose. Os achados contribuem para a validação do uso de CTMs incorporadas a biomateriais como estratégia no tratamento de queimaduras extensas.

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CARACTERÍSTICAS CLÍNICAS DE PACIENTES INTERNADOS NA UTI/COVID-19 ADULTO QUE NECESSITARAM DE SUPORTE HEMOTERÁPICO POR UMA AGÊNCIA TRANSFUSIONAL

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Introdução: A COVID-19 causada pelo novo coronavírus (SARS-CoV-2) apareceu na cidade de Wuhan, China e se espalhou rapidamente pelo mundo levando a Organização Mundial de Saúde a declarar pandemia em março de 2020. Os aspectos clínicos da COVID-19 são inflamação leve/autolimitada das vias aéreas superiores ou pneumonia grave, sepse, falência de múltiplos órgãos e morte. Pessoas idosas estão entre o grupo com o maior risco e pacientes do sexo masculino tendem a ter um prognóstico pior do que as mulheres, necessitando de internação em Unidade de Terapia Intensiva (UTI). **Objetivo:** Analisar as características demográficas, laboratoriais e clínicas dos pacientes internados na UTI/COVID-19 adulto que necessitaram de transfusão sanguínea. **Material e método:** Trata-se de um estudo epidemiológico retrospectivo de corte observacional onde foram analisados os dados registrados nos prontuários de todos os pacientes internados na UTI/COVID-19 adulto e que foram atendidos pela Agência Transfusional do Hospital de Clínicas da Universidade Federal de Uberlândia durante o período de junho de 2020 a outubro de 2021. **Resultados:** Um total de 142 pacientes necessitaram de transfusão de hemocomponente. Cento e quatro pacientes (73,2%) evoluíram para óbito e 38 pacientes (26,8%) receberam alta hospitalar. A mediana dos pacientes que evoluíram para óbito foi de 63 anos. O sexo masculino (72,2%) e a etnia branca (60,6%) foram os grupos com maiores números de óbitos. Não houve diferença na frequência do sistema sanguíneo ABO entre os pacientes internados, grupos A (43,3%) e O (43,3%), entre os pacientes que evoluíram para óbito. Na avaliação do sistema Rh, os pacientes que apresentavam o antígeno D (Rh +) tiveram uma porcentagem de 85,6% entre os pacientes que evoluíram para óbito. Avaliando os índices hematimétricos (plaquetas, hemoglobina, hematócrito e neutrófilos) não houve diferença entre os grupos. O número mediano de linfócitos dos pacientes que evoluíram para óbito foi de 760/mm^3, enquanto o número dos pacientes que recebeu alta foi de 1044/mm^3. As comorbidades com frequência maior encontrada nos pacientes que evoluíram para óbito foram diabetes (80,9%), hipertensão arterial sistêmica (73,3%), obesidade (76,7%) e asma (85,3%). A necessidade de transfusão de hemocomponente, principalmente concentrado de hemácias, foi maior no grupo de pacientes que evoluiu para óbito (93,3%). Enquanto a transfusão de plasma fresco congelado e plaqueta não foram significativas. **Conclusão:** Portanto, aspectos como idade avançada, sexo masculino, portador de obesidade e contagem baixa de linfócitos foram preditivos para uma pior evolução dos pacientes internados na UTI/COVID-19 adulto. Não encontramos relação do sistema ABO entre os grupos do estudo. Além disso, pacientes que evoluíram para óbito necessitaram de maior transfusão de hemácias.

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COMPARISON OF THE ANTINEOPLASTIC POTENTIAL OF PIPER NIGRUM L. ESSENTIAL OIL AND ITS ALKALOID PIPERINE IN AN ACUTE LYMPHOBLASTIC LEUKEMIA CELL LINE

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Introduction: Leukemia ranks as the 10th most frequent type of cancer in Brazil, according to estimates for the 2023–2025 period, with acute lymphoblastic leukemia (ALL) being the most common cancer type among individuals aged 0 to 19 years, according to the Ministry of Health. This hematological neoplasm is characterized by high rates of relapse and resistance to conventional treatments. In this context, the search for therapeutic alternatives derived from natural products has gained prominence due to the potential of bioactive compounds to predominantly target tumor cells. Among these, the species *Piper nigrum L.* (black pepper) stands out, whose main alkaloid, piperine, has demonstrated anti-inflammatory, antioxidant, and antitumor activities in various cell models. In this context, it is of interest to compare the essential oil and the isolated alkaloid regarding their

potential antineoplastic activity against leukemias. **Aim:** To evaluate the in vitro cytotoxicity of *Piper nigrum* (black pepper) oil and its isolated alkaloid, piperine, in the Nalm6 cell line derived from acute lymphoblastic leukemia. **Material and methods:** Cells were cultured in flasks containing RPMI medium supplemented with 10% fetal bovine serum and 1% penicillin-streptomycin and maintained at 37°C in a 5% CO_2 atmosphere. The MTT assay was performed to evaluate the effect of the substances on Nalm6 cell viability. Cells were seeded in 96-well plates at a concentration of 30,000 cells/well and treated with black pepper oil and isolated piperine, previously dissolved in dimethyl sulfoxide (DMSO) to obtain initial concentrations of 15.4 and 12.2 mg/mL, respectively. A dose-response assay was then carried out with concentrations ranging from 100 to 1.56 μg/mL. After 72 hours of treatment, the supernatant was removed, and an MTT solution at 5 mg/mL was added and incubated for 3 hours in a CO_2 atmosphere. Subsequently, the solution was removed, and DMSO was added to fully dissolve the formazan crystals. Data analysis was performed using GraphPad Prism 9.0 software, with the experiment conducted in triplicate. **Results:** The main results were obtained from the evaluation of the mean inhibitory concentrations (IC50) of *Piper nigrum* compounds on cell growth. Both substances significantly reduced the viability of the Nalm6 cell line, with IC50 values of 21.6 μg/mL for black pepper oil and 14.1 μg/mL for the isolated alkaloid piperine, the latter showing greater cytotoxic effect. **Discussion and conclusion:** Cell viability assays demonstrate that both *Piper nigrum* essential oil and its major alkaloid, piperine, have relevant cytotoxic effects against the Nalm6 cell line, representative of ALL. The lower IC50 value for piperine compared to the essential oil suggests that the alkaloid is one of the main constituents responsible for the antineoplastic activity of *Piper nigrum*. These findings are consistent with recent investigations that address piperine as a potential antineoplastic agent in different types of cancer, particularly gastric cancer (RAMOS et al., 2023). Therefore, it is of great interest to conduct further biological tests comparing the use of the oil and the isolated compound, as well as to evaluate these substances in non-neoplastic hematological cells.

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ID - 2139

DECODING STROMAL ARCHITECTURE IN PANCREATIC TUMOR THROUGH SPHEROMAP CYTOMETRY: A PLATFORM FOR THERAPEUTIC DISCOVERY

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Introduction: Pancreatic ductal adenocarcinoma is characterized by a dense stroma predominantly formed by cancer-associated fibroblasts (CAFs). These cells are key drivers of tumor progression, immune exclusion and therapy resistance. While CAFs exist as two functionally distinct and reversible phenotypes—myofibroblastic (myCAFs) and inflammatory (iCAFs)—their spatial distribution and the mechanisms underpinning this heterogeneity remain poorly understood. **Aim:** Here, we present SpheroMap Cytometry, an innovative spatial flow cytometry method that enables high-resolution analysis of spatially organized cellular phenotypes within spheroids. This approach leverages Image-iT Green Hypoxia, a fluorescent probe that accumulates in hypoxic cells, enabling spatial mapping of cells dissociated from spheroids. **Material and methods:** Therefore, heterotypic spheroids composed of CAPAN-1 pancreatic tumor cells and HS-5 bone marrow stromal or umbilical-cord-derived mesenchymal stromal cells (UC-MSCs); or homotypic spheroids composed solely of HS-5 or UC-MSCs cells were cultured in ultra-low-adhesion 96-well plates. After 48h aggregation, spheroids were incubated with the hypoxia probe and after 72h they were dissociated and stained with CD73 and CD140B antibodies. **Results:** We identified a robust enrichment of $CD73^+$/$CD140B^+$ myCAF-like cells within the hypoxic core. In tumor-HS-5 spheroids, co-expression of CD73 and CD140B reached 59.27% in hypoxia *vs* 49.37% in normoxia ($p < 0.01$). Similarly, UC-MSC spheroids showed even stronger co-expression in hypoxia 80.57% *vs* 38.5% in normoxia ($p < 0.0001$). We observed the presence of a distinct subpopulation of small stromal cells (FSClow/SSClow) lacking expression of CD73 and CD140B. Upon exposure to hypoxia, these cells acquired CD73 and CD140B expression transitioning toward a myCAF phenotype as they also increased in size and complexity (FSChigh/SSChigh). Our findings point to the hypoxic tumor microenvironment (TME) not only as a trigger for phenotypic reprogramming, but also as a niche where immature or quiescent fibroblast cells are converted into immunosuppressive, tumor-supportive myCAFs. Moreover, while hypoxia alone was sufficient to drive myCAF differentiation in heterotypic (~70%) and monotypic spheroids (~40%), we found that normoxic induction of myCAF occurred only in tumor cells presence, reaching 47% (tumor–HS-5) and 30% (tumor–UC-MSCs), but dropping to ~10% and ~1% in monotypic spheroids. **Discussion and conclusion:** Our results raise the possibility that the spatial proximity of myCAF cells to tumor cells may not result solely from paracrine signaling. Instead, it may reflect their shared occupancy of hypoxic tumor regions that actively promote a myCAF phenotype. This has profound implications for understanding how CAF heterogeneity is shaped and how spatial organization influences immunosuppressive dynamics within the TME. By preserving hypoxia-derived spatial information post-dissociation, SpheroMap Cytometry bridges the gap between functional imaging and high-throughput