Isso incluiu marcadores específicos usados para fins diagnósticos, como NG2 para leucemia pró-B ou marcadores plaquetários e megacariocíticos em suspeita de leucemia megacariocítica. Os genes foram identificados por meio de pesquisas em plataformas como NCBI, utilizando cada marcador como palavra-chave. Subsequentemente, esses genes foram categorizados de acordo com as linhagens predominantes que representam, incluindo linfócitos B, linfócitos T, mieloides e padrões comuns em todos os grupos de LAs. A análise de GO avaliou os processos biológicos (PBs) associados aos genes e suas funções esperadas com base na linhagem celular. As interações entre esses genes e PBs foram visualizadas usando o pacote ggnet no R 4.3.0 e RStudio, com genes e PBs chave destacados usando o pacote circlize e circos plot, inferidos com base em valores de p refletindo o efeito das conexões entre grupos. **Resultados e discussão:** : A análise revelou que os 35 genes associados aos marcadores estudados estão envolvidos em 674 PBs, destacando-se processos críticos como ativação e proliferação de células T e B, desenvolvimento celular (hematopoiese e diferenciação) e produção de citocinas (IL-8, IL-2, TNF). Esses achados enfatizam a importância dos processos imunes associados aos marcadores de citometria de fluxo na patogênese das LAs. A ativação e proliferação de células T e B são essenciais para uma resposta imune eficaz, enquanto a produção de citocinas desempenha um papel multifacetado na regulação do crescimento e diferenciação celular. Os resultados da análise de GO ressaltam a relevância dessas funções na leucemia, sugerindo que alterações na expressão desses marcadores podem impactar a interação entre essas funções, oferecendo potenciais insights sobre a progressão da doença. Esta análise também destaca a importância de uma abordagem integrada que combina dados de citometria de fluxo com análises genômicas para explorar a complexidade das LAs. **Conclusão:** Este estudo demonstra que a análise de ontologia genética pode fornecer valiosos insights sobre os mecanismos patológicos nas leucemias agudas. A integração da imunologia sistêmica com dados de citometria de fluxo representa uma abordagem inovadora para compreender as correlações genéticas dos marcadores, fornecendo uma base para pesquisas futuras. Explorar como as alterações nos PBs associados a esses marcadores podem influenciar o desenvolvimento e a progressão das LAs pode levar a novos insights diagnósticos e terapêuticos.

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BONE MARROW ASPIRATION: ANALYSIS OF REQUESTS AND APPROVALS BETWEEN 2012 AND 2023 IN BRAZIL

RC Venâncio [a,b], JISD Gomes [a], JEB Silva [a],
AEO Rego [a], MFD Nascimento [a], PRC Passos [b],
AG Guedes [a], TTLA Filho [a], TLM Lopes [a],
RS Frota [a]

[a] *Universidade Estadual do Ceará (UECE), Fortaleza, Brazil*
[b] *Center for Research and Drug Development (NPDM), Universidade Federal do Ceará (UFC), Fortaleza, Brazil*

Introduction: Bone Marrow Aspiration (BMA) is a procedure used for the diagnosis of onco-hematological diseases. Currently, there is an increase in myeloproliferative diseases, which are related to harmful habits in the population, such as exposure to radical-forming products that act as aggressors to the physiology of each individual. In Brazil, BMA is associated with over 30,000 requests between 2012 and 2013, reflecting an increase in the incidence of these onco-hematological pathologies, which account for more than 15,000 diagnoses annually. **Objectives:** Conduct a quantitative analysis of Bone Marrow Aspiration (BMA) requests and approvals in Brazil over a 12-year period. **Methodology:** This is a descriptive-analytical study based on data from the “Tabnet” platform. The data obtained followed a careful retrieval process, detailed as follows: The “Tabnet” platform was accessed through DATASUS, followed by the selection of the “Health Assistance” axis and the “Ambulatory Production (SIA/SUS)” topic using the “by place of care - from 2008” option, restricting to “Geographic Coverage”, and then to “Brazil and Region by Federal Unit”. Data on “approved quantities” and “presented quantities” were extracted for the period from 2012 to 2023, focusing on the “Bone Marrow Aspiration” procedure. **Results:** In Brazil, over the 12-year period, a total of 395,061 Bone Marrow Aspiration (BMA) requests were observed, of which 382,356 (97%) were approved. When dividing the period into three four-year segments and analyzing the averages of the procedures, it is observed that, in the first segment (2012-2015), the overall average number of requests was 34,447.5, while approvals reached 33,757.5 (98%). In the second four-year period (2016-2019), the number of requests was 32,247, while approvals amounted to 31,494.5 (98%). In the third four-year period (2020-2023), the number of requests was 32,169, with 31,025 (96%) being approved. Thus, it is observed that from the first to the second four-year period, there was a reduction of 2,200.50 (6.4%) in requests and 2,263.00 (6.8%) in approvals. From the second to the third four-year period, the number of requests decreased by 78 (0.3%) and approvals fell by 469.5 (1.5%). **Discussion:** Initially, it was observed that the approval/presentation rate remained above 95% throughout the entire analyzed period. This implies that the vast majority of patients benefit from the procedure, leading to more accurate diagnoses. Consequently, patients can receive appropriate treatment and experience improved clinical outcomes. **Conclusion:** Thus, through this study, it was possible to clarify that bone marrow aspiration is a highly requested procedure. This highlights two scenarios expressed simultaneously. The first scenario indicates that Brazilian society is experiencing a period of increased incidence of onco-hematological diseases, and the second shows that physicians are aware of this issue and, in an effort to improve patient care, are seeking procedures aimed at earlier or faster diagnosis.

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BONE MARROW ASPIRATION: COST ANALYSIS OVER 12 YEARS IN BRAZIL

RC Venâncio [a,b], JISD Gomes [a], AEO Rego [a], JEB Silva [a], PRC Passos [b], JVC Goes [b], MFD Nascimento [a], GM Penha [a], CCV Costa [a], EBS Martins [a]

[a] *Universidade Estadual do Ceará (UECE), Fortaleza, Brazil*

[b] *Center for Research and Drug Development (NPDM), Universidade Federal do Ceará (UFC), Fortaleza, Brazil*

Introduction: Bone Marrow Aspiration (BMA) is used for the diagnosis of oncological diseases affecting blood components, such as myeloproliferative disorders. Nowadays, BMA is considered a high-cost procedure, reaching total values of R$215,000 in 2012. Given the complexity of the procedure and its importance for patient care, understanding the costs incurred in the public health system can help professionals recommend the tests at the appropriate time and under suitable circumstances. **Objectives:** To analyze the presented and approved costs for Bone Marrow Aspiration (BMA) procedures in Brazil over a 12-year period. **Methodology:** This is a descriptive-analytical study based on data from the "Tabnet" platform. The data were obtained through a careful process, detailed as follows: The "Tabnet" platform was accessed through DATASUS, followed by selecting the "Health Assistance" axis and the "Ambulatory Production (SIA/SUS)" topic using the "by place of care - from 2008" option, and restricting to "Geographic Coverage", then to "Brazil and Region by Federal Unit". Data on "approved values" and "presented values" were extracted for the period 2012-2023 and limited to the "Bone Marrow Aspiration" procedure. Monetary values were adjusted using the General Market Price Index (IGP-M). **Results:** Initially, it was observed that the total forecasted cost for the procedure over the study period was R$2,505,235.58, with an allocation of R$2,425,516.12 (97%). When dividing the period into three four-year segments and calculating their respective averages, it was found that in the first segment (2012-2015), the presented value was R$213,661.87, with R$209,356.43 (98%) used for the procedures. In the second four-year period (2016-2019), the presented values were R$199,477.95, with approvals reaching R$195,793.30 (98%). In the third four-year period, the total requested was R$213,407.86, while the allocation was R$204,965.23 (96%). Additionally, it was observed that between the first and second four-year periods, there was a reduction in the presented values by R$14,183.92 (6.7%), and approved values fell by R$13,563.13 (6.5%). Conversely, between the second and third four-year periods, there was an increase in both the presented and approved amounts, respectively, by R$13,929.91 (7%) and R$9,171.94 (5%). **Discussion:** At first glance, it is evident that over the 12-year period analyzed, there was a substantial investment in maintaining and performing the procedure. These expenditures, exceeding 95% of the forecasted costs for requests throughout the period, indicate that the Ministry of Health (MS) recognizes the importance of the procedure for the prognosis of patients with myeloproliferative diseases. Additionally, there is a minimal reduction in the costs related to the procedure, typically less than 8%. This fact simultaneously reinforces the previous observation, highlighting the importance that the State places on this particular procedure. **Conclusion:** In conclusion, it was analyzed that over the 12-year period studied, the presented and approved costs for Bone Marrow Aspiration (BMA) reached a substantial level, demonstrating that despite the complexity of the procedure, the Unified Health System (SUS) invests in providing it to patients, ultimately aiming for diagnostic accuracy and treatment of the disease.

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APLICAÇÃO DE INTELIGÊNCIA ARTIFICAL NA DETECÇÃO DE PLASMÓCITOS EM DADOS DE IMUNOFENOTIPAGEM POR CITOMETRIA DE FLUXO

IAF Bahia [a,b], RGS Maia [b], MF Moss [b], ML Dumas [b], RS Barroso [b]

[a] *Departamento de Imunologia, Instituto de Ciências Biomédicas, Universidade de São Paulo (USP), São Paulo, SP, Brasil*

[b] *Flowmentor - Diagnóstico Integrado e Citometria de Fluxo, São Paulo, SP, Brasil*

Objetivo: Desenvolver um algoritmo baseado em dados de imunofenotipagem por citometria de fluxo, utilizando um painel específico para detecção de plasmócitos anômalos, com a capacidade de identificá-los em amostras clínicas. **Métodos:** Foram utilizados dados de imunofenotipagem por citometria de fluxo de 19 casos com plasmócitos de fenótipo normal e 69 casos com anomalias fenotípicas plasmocitárias. As expressões dos seguintes marcadores foram avaliadas: CD19, CD20, CD38, CD45, CD56, CD117, CD138, CD200, HLA-DR, cKappa, cLambda. O algoritmo foi treinado para reconhecer as características específicas dos plasmócitos, considerando a heterogeneidade dos casos analisados e a referência das populações normais. A análise foi realizada no R e RStudio, com processamento extensivo dos dados, iniciando pela leitura através do pacote flowCore, com isolamento das populações plasmocitárias com base nos marcadores CD38 e CD138, seguido de *clustering* através do FlowSOM e estudos para avaliação da heterogeneidade e definição das populações plasmocitárias. Por fim, um modelo de *machine learning*