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血清 sCD14、CRP、PCT 在急性胰腺炎中的表达及与 APACHE II、BISAP 的相关性 *

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摘要 目的:探讨血清可溶性白细胞分化抗原 14(sCD14)、C 反应蛋白(CRP)、降钙素原(PCT)在急性胰腺炎中的表达及与急性生理功能和慢性健康状况评分系统 II (APACHEII)、急性胰腺炎严重程度床边指数(BISAP)的相关性。**方法:**选择 2019 年 1 月~2021 年 1 月于我院进行治疗的急性胰腺炎患者 150 例患者进行研究, 设为病例组, 并选择我院同期体检健康者 50 例作为对照组, 分析患者血清 sCD14、CRP、PCT 水平变化情况与 APACHE II、BISAP 之间的相关性。**结果:**病例组患者血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平均显著高于对照组, 差异显著 ($P<0.05$); 轻度患者血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平均显著低于中度、重度患者, 中度患者血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平均显著低于重度患者, 差异显著 ($P<0.05$); 相关性分析结果显示, 血清 sCD14、CRP、PCT 与 APACHE II、BISAP 之间均呈正相关 ($r=0.449, 0.649, 0.584, 0.488, 0.674, 0.663, P<0.05$)。**结论:**急性胰腺炎患者血清 sCD14、CRP、PCT 均呈高表达, 且与 APACHE II、BISAP 密切相关。**关键词:**可溶性白细胞分化抗原 14; C 反应蛋白; 降钙素原; 急性胰腺炎; 急性生理功能和慢性健康状况评分系统 II; 急性胰腺炎严重程度床边指数; 相关性

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Expression of Serum sCD14, CRP and PCT in Acute Pancreatitis and their Correlation with APACHE II and BISAP*

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ABSTRACT Objective: To study Expression of serum Soluble Differentiation antigen 14 (sCD14), C-reactive protein (CRP), procalcitonin (PCT) in acute pancreatitis and their correlation with Acute physiological function and chronic health status scoring system II (APACHEII), bedside acute pancreatitis severity index (BISAP). **Methods:** 150 patients with acute pancreatitis who were treated in our hospital from January 2019 to January 2021 were selected as the case group, and 50 healthy patients who were examined in our hospital during the same period were selected as the control group. The changes of serum sCD14, CRP and PCT levels and their correlation with APACHE II and BISAP were analyzed. **Results:** The serum levels of sCD14, CRP, PCT, APACHE II and BISAP in case group were significantly higher than those in control group, with significant differences ($P<0.05$); The serum levels of sCD14, CRP, PCT, APACHE II and BISAP in mild patients were significantly lower than those in moderate and severe patients, and the serum levels of sCD14, CRP, PCT, APACHE II and BISAP in moderate patients were significantly lower than those in severe patients, with significant differences ($P<0.05$). Correlation analysis results showed that serum sCD14, CRP and PCT and APACHE II, there was a positive correlation between BISAP ($r=0.449, 0.649, 0.584, 0.488, 0.674, 0.663, P<0.05$). **Conclusion:** Serum sCD14, CRP and PCT were highly expressed in patients with acute pancreatitis, and were closely related to APACHE II and BISAP.

Key words: Soluble leukocyte differentiation antigen 14; C-reactive protein; Procalcitonin; Acute pancreatitis; Acute physiological function and chronic health status scoring system II; Bedside index of acute pancreatitis severity; The correlation

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前言

急性胰腺炎是消化系统常见急腹症之一,主要是由于胰酶在胰腺组织内被激活而引发胰腺自身出血、坏死,可波及其他脏器系统,临床表现为轻度腹部不适、恶心、呕吐等症状,随着疾病的进展可出现代谢紊乱、多器官功能障碍综合征等,发展为重症急性胰腺炎,严重威胁人们的生命^[1-3]。因此,对急性胰腺炎早期进行预测并判断病情严重程度对改善患者预后具有重要意义^[4]。有研究显示,炎症细胞因子与急性胰腺炎患者局部组织变化密切相关,参与了疾病的发展^[5]。CRP 是诊断急性慢性炎症的敏感指标,在炎症或心肌梗死等疾病中其水平升高;PCT 是一种蛋白质,是临床公认的反应全身炎症状态的指标,当机体发生严重感染时其含量增加^[6,9]。CD14 是机体炎症反应的标志物之一,在机体中以 sCD14 的形式存在,可通过与病原体抗原结合,介导机体炎症反应,近年来被证实对脓毒症、急性呼吸窘迫综合征等疾病的早期诊断具有临床价值^[10]。但血清 sCD14 在急性胰腺炎中的表达尚不明确,因此,本研究旨在探讨血清 sCD14、CRP、PCT 在急性胰腺炎中的表达,并分析其与 APACHE II、BISAP 的相关性。

1 资料与方法

1.1 一般资料

选择 2019 年 1 月~2021 年 1 月于我院进行治疗的急性胰腺炎患者 150 例患者进行研究,设为病例组,其中男 89 例,女 61 例,年龄 30-72 岁,平均(50.53±7.59)岁,其中胆源性胰腺炎 72 例,特发性胰腺炎 48 例,酒精性胰腺炎 25 例,高脂血症性胰腺炎 5 例,根据《急性胰腺炎诊治指南 2014》^[11]将没有器官功能衰竭及局部全身并发症患者分为轻度组 69 例,中度 61 例,重度 20 例;选择同期在我院进行检查的 50 例人群为对照

组,其中男性 33 例,女性 17 例;年龄 28-71 岁,平均(50.48±7.46)岁。两组年龄比较差异无统计学意义($P>0.05$)。

参照《急性胰腺炎中西医结合诊疗共识意见》^[12]:伴有特征性腹痛;急性胰腺炎特征性的 CT 表现。

纳入标准:①符合上述诊断标准;②临床资料完整;③无长期服用影响检测结果的药物;④签署知情同意书;⑤非胰腺炎肿瘤患者。排除标准:①先天免疫性疾病者;②神志不清者;③合并恶性肿瘤者;④1 个月内有感染病史或入院前合并感染者;⑤无法配合相关检查者;⑥依从性较差者;⑦神志不清者;⑧严重肝肾疾病者。

1.2 方法

采集两组对象入组后第 2 d 清晨空腹静脉血,以 3000 r·min⁻¹ 的速度进行离心,离心半径 10 cm,时间 10 min,提取上层血清后,置于零下 20℃ 的冷冻箱内存储以备检测,采用酶联免疫吸附法测定血清 sCD14、CRP、PCT 水平,试剂盒由深圳晶美生物技术有限公司生产,仪器均使用东芝 GA800 生化分析仪,操作严格按试剂盒说明进行。

1.3 统计学分析

以 spss24.0 软件包处理,正态分布计量资料以均数±标准差($\bar{x} \pm s$)表示,组间比较采用独立样本 t 检验;计数资料以例数和率(%)表示,组间比较采用 χ^2 检验;多组比较采用方差分析,相关性分析采用 Spearman 相关分析,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平比较

病例组患者血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平均显著高于对照组,差异显著($P<0.05$),见表 1。

表 1 两组血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平比较($\bar{x} \pm s$)

Table 1 Comparison of serum sCD14, CRP, PCT, APACHE II and BISAP levels between the two groups($\bar{x} \pm s$)

Groups	n	sCD14($\mu\text{g/mL}$)	CRP(mg/L)	PCT(ng/mL)	APACHE II (points)	BISAP(points)
Case group	150	1.53±0.27	65.58±27.41	1.85±0.71	10.15±2.34	3.62±0.48
Control group	50	1.17±0.15	5.68±1.33	0.44±0.19	2.14±0.51	0.87±0.15
t value		8.968	15.421	13.857	23.978	39.809
P value		0.000	0.000	0.000	0.000	0.000

2.2 不同疾病严重程度血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平比较

轻度患者血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平均显著低于中度、重度患者,中度患者血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平均显著低于重度患者,差异显著($P<0.05$),见表 2。

2.3 血清 sCD14、CRP、PCT 与 APACHE II、BISAP 的相关性分析

相关性分析结果显示,血清 sCD14、CRP、PCT 与 APACHE II、BISAP 之间均呈正相关($r=0.449, 0.649, 0.584, 0.488, 0.674, 0.663, P<0.05$),见图 1~6。

3 讨论

胰腺是人体消化系统的重要组成部分,通过分泌胰液中大量的消化酶辅助人体消化食物,急性胰腺炎是常见消化系统疾病,是由于不良生活饮食习惯引起的疾病,随着人们生活水平的提高,其发病率逐年上升,给患者带来巨大的痛苦及高额的医疗费用^[13,14]。国外研究显示,每年约有 275 000 名患者因急性胰腺炎住院治疗,医疗费用总和超过 26 亿美元^[15]。急性胰腺炎是进展性疾病,根据病情严重程度可分为轻症和重症,轻症主要表现为胰腺水肿,在 3~5 d 内自行恢复;重症则可诱发全身炎症反应综合征,并发多器官功能障碍综合征,其中重症胰腺

炎在所有急性胰腺炎患者中占 10%~20%，死亡率约为 5%，比其他危重疾病的死亡率高，严重损害患者健康^[16,17]。因此，对急性胰腺炎进行早期预测，评估疾病的严重程度，提高临床治疗水平对改善患者预后具有重要意义。

表 2 不同疾病严重程度血清 sCD14、CRP、PCT 及 APACHE II、BISAP 水平比较($\bar{x} \pm s$)

Table 2 Comparison of serum sCD14, CRP, PCT, APACHE ii and BISAP levels in different disease severity($\bar{x} \pm s$)

Groups	n	sCD14($\mu\text{g/mL}$)	CRP(mg/L)	PCT(ng/mL)	APACHE II (points)	BISAP(points)
Mild	69	1.34 $\pm$ 0.25	52.59 $\pm$ 15.56	1.39 $\pm$ 0.58	7.25 $\pm$ 2.31	2.76 $\pm$ 0.51
Moderate	61	1.52 $\pm$ 0.29	65.48 $\pm$ 27.45	1.82 $\pm$ 0.73	10.08 $\pm$ 2.35	3.63 $\pm$ 0.52
Severe	20	2.22 $\pm$ 0.32	110.70 $\pm$ 31.52	3.53 $\pm$ 0.81	20.37 $\pm$ 2.68	6.56 $\pm$ 0.73
F value		78.583	47.777	77.636	236.209	373.727
P value		0.000	0.000	0.000	0.000	0.000

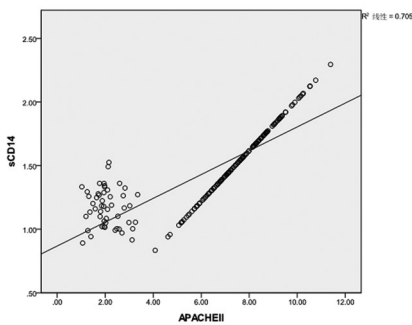


图 1 APACHE II 和血清 sCD14 的散点图
Fig.1 Scatter plot of APACHE II and serum sCD14

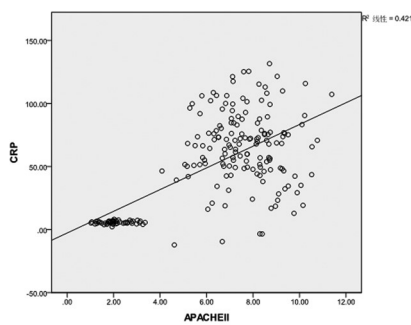


图 2 APACHE II 和血清 CRP 的散点图
Fig.2 Scatter plot of APACHE II and serum CRP

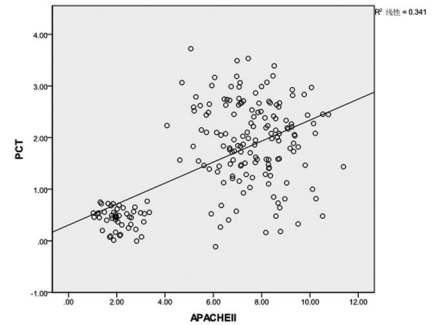


图 3 APACHE II 和血清 PCT 的散点图
Fig.3 Scatter plot of APACHE II and serum PCT

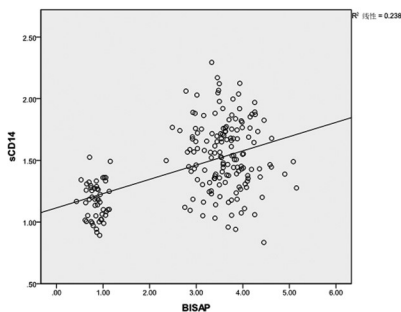


图 4 BISAP 和血清 sCD14 的散点图
Fig.4 Scatter plot of BISAP and serum sCD14

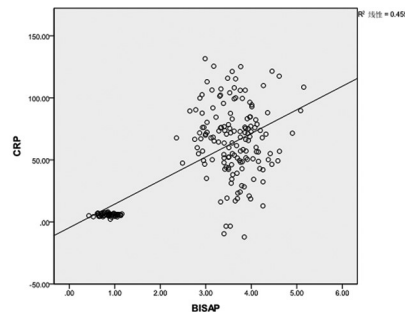


图 5 BISAP 和血清 CRP 的散点图
Fig.5 Scatter plot of BISAP and serum CRP

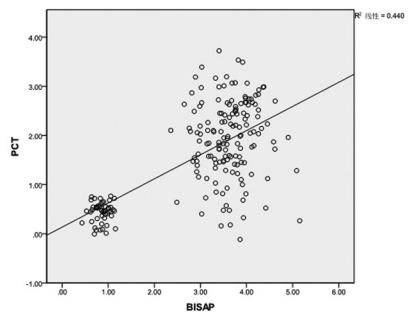


图 6 BISAP 和血清 PCT 的散点图
Fig.6 Scatter plot of BISAP and serum PCT

有研究显示，在胰腺炎发病中胰腺自身消化，导致胰腺中胰酶异常活化，使组织坏死，从而引起急性炎症反应，而炎症会加重胰腺损伤，从而导致多器官功能综合征，增加患者的死亡风险，因此，观察炎症细胞因子水平变化具有重要意义^[18,19]。CRP 是一种急性期反应蛋白，主要来源于肝细胞，在机体发生感染数小时后其含量增加，并在 24~48 h 达到高峰，其水平表达与水平与胰腺炎的严重程度及预后密切相关^[20-22]。PCT 由肝脏、脾、肺、小肠等单核细胞分泌，在正常情况下其含量低，在炎症或细菌感染时，PCT 可通过巨噬细胞、单核细胞合成释放入血，导致其水平明显升高^[23,24]。有研究显示，PCT 在重症肺炎中表达升高，且与炎症严重程度密切相关^[25]。本研究结果显示，急性胰腺炎患者血清 CRP、PCT 在水平高于健康人群，且轻度患者血清 CRP、PCT 水平均显著低于中度、重度患者，中度患者血清 CRP、PCT 水平均显著低于重度患者，说明，血清 CRP、PCT

参与了疾病的发生与发展。分析其原因可能是因为，急性胰腺炎是一种炎症相关疾病，疾病的发生可导致细菌感染，大量坏死的胰腺组织会释放各种细胞内成分，从而诱导大量内毒素释放，从而导致体内血清 CRP、PCT 升高。CD14 属于细胞表面糖蛋白家族，是一种特异性的单核细胞和巨噬细胞表面标志物，在人体中以 sCD14 的形式存在，是革兰阴性菌内毒素脂多糖的高亲和受体，能介导脂多糖引起细胞炎症反应，在健康人中其浓度很低，能促进单核细胞与活化的上皮细胞黏附，抑制 T 细胞增殖，促使巨噬细胞黏附到激活的内皮细胞，清除细菌脂多糖，减轻炎症反应^[26,27]。有研究显示，sCD14 能激活下游的酪氨酸蛋白激酶，引起“瀑布式炎症反应”，并激活凝血和纤溶系统，引起脓毒症的发生^[28,29]。本研究结果显示，急性胰腺炎患者血清 sCD14 高于健康人群，且轻度患者血清 sCD14 水平均显著低于中度、重度患者，中度患者血清 sCD14 水平均显著低于

重度患者,结果表明,血清 sCD14 在急性胰腺炎呈高表达,且可随着疾病的严重程度而升高,可作为预测疾病严重程度的标志物,可能是因为急性胰腺炎的发生可激活患者机体内炎症因子的释放,而血清 sCD14 是新发现的介导全身炎症的指标,在疾病的发生时参与了其发展,从而导致其水平升高。

APACHE II、BISAP 是临床常用的评估胰腺炎病情严重程度的评分,能早期预测严重度及病死率,且 BISAP 可反复对急性胰腺炎患者病情进行评价,动态观察患者病情变化^[30,31]。本研究结果显示,急性胰腺炎患者 APACHE II、BISAP 评分高于健康人,且轻度患者 APACHE II、BISAP 水平均显著低于中度、重度患者,中度患者 APACHE II、BISAP 水平均显著低于重度患者,提示,APACHE II、BISAP 在急性胰腺炎中评分较高,且可随着疾病的严重程度而升高。本研究进一步相关性分析,血清 sCD14、CRP、PCT 与 APACHE II、BISAP 之间均呈正相关,结果提示,血清 sCD14、CRP、PCT 可随着 APACHE II、BISAP 评分的升高而升高,可作出预测急性胰腺炎严重程度的标志物。

综上所述,急性胰腺炎患者血清 sCD14、CRP、PCT 均呈高表达,且与 APACHE II、BISAP 密切相关。

参考文献(References)

- [1] Moka P, Goswami P, Kapil A, et al. Impact of Antibiotic-Resistant Bacterial and Fungal Infections in Outcome of Acute Pancreatitis[J]. *Pancreas*, 2018, 47(4): 489
- [2] Xi M Z, Zheng Y Z, Chen H Z, et al. Intestinal Microbial Community Differs between Acute Pancreatitis Patients and Healthy Volunteers [J]. *Biomedical & Environmental Sciences*, 2018, 31(1): 81-86
- [3] Wang L, Zeng Y B, Chen J Y, et al. A simple new scoring system for predicting the mortality of severe acute pancreatitis: A retrospective clinical study[J]. *Medicine*, 2020, 99(23): e20646
- [4] Vege S S, Dimagno M J, CE Forsmark, et al. Initial Medical Treatment of Acute Pancreatitis: American Gastroenterological Association Institute Technical Review - ScienceDirect [J]. *Gastroenterology*, 2018, 154(4): 1103-1139
- [5] Hong Y P, Guo W Y, Wang W X, et al. 4-Phenylbutyric Acid Attenuates Pancreatic Beta-Cell Injury in Rats with Experimental Severe Acute Pancreatitis [J]. *International Journal of Endocrinology*, 2018, 2016(7): 4592346
- [6] Liu M W, Wei R, Su M X, et al. Effects of Panax notoginseng saponins on severe acute pancreatitis through the regulation of mTOR/Akt and caspase-3 signaling pathway by upregulating miR-181b expression in rats[J]. *Bmc Complementary & Alternative Medicine*, 2018, 18(1): 51
- [7] Sharma P, Aguilar R, Nader M A, et al. Weekend Effect in Acute Pancreatitis-Related Hospital Admissions in the United States: An Analysis of the Nationwide Inpatient Sample[J]. *Pancreas*, 2018, 47(4): 418
- [8] Elisa B, Stefano A, Giovanni M, et al. Postoperative Acute Pancreatitis Following Pancreaticoduodenectomy: A Determinant of Fistula Potentially Driven by the Intraoperative Fluid Management[J]. *Annals of Surgery*, 2018, 18(4): S77-S78
- [9] Rubina N. Acute Kidney Injury in association with Acute Pancreatitis [J]. *Pakistan Journal of Medical Sciences*, 2018, 34(3): 606-609
- [10] Akira E, Atsushi S, Kiyohide F, et al. Comparative effectiveness of elemental formula in the early enteral nutrition management of acute pancreatitis: a retrospective cohort study[J]. *Annals of Intensive Care*, 2018, 8(1): 69
- [11] Wang CY, Li F, Zhao YP, et al. Guidelines for diagnosis and treatment of acute pancreatitis (2014)[J]. *Journal of Clinical Hepatobiliary Diseases*, 2015(01): 26-29
- [12] Specialized Committee of Digestive System Diseases of Chinese Association of Integrated Traditional and Western Medicine. Consensus on the diagnosis and treatment of integrated traditional Chinese and western medicine for acute pancreatitis (2017)[J]. *Chinese Journal of Digestion of Integrated Traditional and Western Medicine*, 2017, 12(1): 76-88
- [13] Daisuke N, Hiroki N, Yukifumi H, et al. Causal relationship between acute pancreatitis and methylprednisolone pulse therapy for fulminant autoimmune hepatitis: a case report and review of literature [J]. *Journal of Pharmaceutical Health Care & Sciences*, 2018, 4(1): 14
- [14] Li Z, Li X, Shi Z. Clinical observation on severe acute pancreatitis treated with electroacupuncture at Dachangshu (BL 25) and Shangjuxu (ST 37) combined with ulinastatin [J]. *Chinese acupuncture & moxibustion*, 2018, 38(2): 132
- [15] Noda Y, Goshima S, Fujimoto K, et al. Utility of the portal venous phase for diagnosing pancreatic necrosis in acute pancreatitis using the CT severity index[J]. *Abdominal Radiology*, 2018, 43(4): 1-8
- [16] Ji H H, Jung S, Cho S K, et al. Predictive value of apolipoprotein B and A-I ratio in severe acute pancreatitis[J]. *Journal of Gastroenterology and Hepatology*, 2018, 33(2): 548-553
- [17] Padhan R K, Jain S, Agarwal S, et al. Primary and Secondary Organ Failures Cause Mortality Differentially in Acute Pancreatitis and Should be Distinguished[J]. *Pancreas*, 2018, 47(3): 1
- [18] Chis B A, Fodor D. Acute pancreatitis during GLP-1 receptor agonist treatment. A case report[J]. *Clujul Medical*, 2018, 91(1): 117-119
- [19] Huang Z, Ma X, Jia X, et al. Prevention of Severe Acute Pancreatitis With Cyclooxygenase-2 Inhibitors: A Randomized Controlled Clinical Trial[J]. *The American Journal of Gastroenterology*, 2020, 115(3): 11
- [20] Faghih M, Singh V K, Mashayekhi R, et al. Letter: Design flaws in study of differentiating functional abdominal pain, recurrent acute pancreatitis and chronic pancreatitis via radiomics features. Authors' reply[J]. *European Journal of Radiology*, 2020, 125(1): 108871
- [21] Xu L L, Zhao B, Sun S L, et al. High-dose vitamin C alleviates pancreatic injury via the NRF2/NQO1/HO-1 pathway in a rat model of severe acute pancreatitis [J]. *Annals of Translational Medicine*, 2020, 8(14): 852-852
- [22] Serhii D, Oleksiy C, Volodymyr S, et al. Infectious complications of acute pancreatitis: spectrum of causative agents and approaches to antibacterial therapy[J]. *Surgical Chronicles*, 2021, 26(1): 22-24
- [23] Dong X W, Wei M, Ma N, et al. Decreased circulating retinol binding protein is an independent risk factor for local complications of acute pancreatitis [J]. *World Chinese Journal of Digestology*, 2021, 29(15): 873-879
- [24] Omair U, Azmat U, Rakhshani A Q. Diagnostic accuracy of computed tomography scoring index in predicting mortality among suspected patients of acute pancreatitis [J]. *International Journal of Endorsing Health Science Research(IJEHSR)*, 2021, 9(2): 201

45-48

- [13] Ragab S A, Abouelela Y S, Daghash S M, et al. Comparative Morphological and Histochemical Characteristics of the Nasal Cavity and Paranasal Sinuses of Adult Rabbits and Domestic Cats in Egypt. *Int J Vet Sci Med*, 2020, 15(22): 1333-1337
- [14] He X Y, Liu Z H, Zhang Q. Radiologic Features of Nuclear Protein of the Testis Midline Carcinoma of the Nasal Cavity and Paranasal Sinuses: Report of One Case [J]. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao*, 2020, 42(2): 279-282
- [15] Kaliadzie H Z, Makarevich M, Ev Menenko A. PO-155 Epidemiological aspects of cancer of the nasal cavity and paranasal sinuses in the Republic Belarus[J]. *Radiother Oncol*, 2019, 132(14): 82-83
- [16] Hu Y, Liu S, Liu P, et al. Clinical relevance of eosinophils, basophils, serum total IgE level, allergen-specific IgE, and clinical features in atopic dermatitis[J]. *J Clin Lab Anal*, 2020, 34(5): 6-13
- [17] Sharma R S, Sharma R, Bansal R. Relationship between total serum immunoglobulin E level and total eosinophils count with skin reactivity in children with allergic rhinitis and asthma in North Indian population[J]. *Indian J All Asth Immunol*, 2020, 34(2): 81
- [18] Simon S, Hu X, Panten J, et al. Eosinophil accumulation predicts response to melanoma treatment with immune checkpoint inhibitors[J]. *OncoImmunology*, 2020, 9(1): 1727116
- [19] Knuplez E, Curcic S, Theiler A, et al. Lysophosphatidylcholines inhibit human eosinophil activation and suppress eosinophil migration in vivo [J]. *Biochim Biophys Acta Mol Cell Biol Lipids*, 2020, 1865(7): 158686
- [20] Kartolo A, Holstead R, Hopman W, et al. Prognosticating role of serum eosinophils on immunotherapy efficacy in patients with advanced melanoma[J]. *Immunotherapy*, 2020, 13(325): 991-996
- [21] Sek A C, Moore I N, Smelkinson M G, et al. Eosinophils Do Not Drive Acute Muscle Pathology in the mdx Mouse Model of Duchenne Muscular Dystrophy[J]. *J Immunol*, 2019, 203(2): 476-484
- [22] Makhssitaliev M, Djuraev J, Khodjanov S, et al. The Functional State Of The Mucous Membrane Of The Nasal Cavity And Paranasal Sinuses After Radical And Minimally Invasive Surgical Interventions [J]. *Ta J Mspr*, 2021, 3(14): 2677-2681
- [23] Hu W, Hu J, Huang Q, et al. Particle Beam Radiation Therapy for Adenoid Cystic Carcinoma of the Nasal Cavity and Paranasal Sinuses [J]. *Front Oncol*, 2020, 10(1): 572493
- [24] Schilling AL, Kulahci Y, Moore J, et al. A thermoresponsive hydrogel system for long-acting corticosteroid delivery into the paranasal sinuses[J]. *J Control Release*, 2021, 10(330): 889-897
- [25] Thompson LDR, Franchi A. New tumor entities in the 4th edition of the World Health Organization classification of head and neck tumors: Nasal cavity, paranasal sinuses and skull base [J]. *Virchows Arch*, 2018, 472(3): 315-330
- [26] Cp A, SS A, Pk B. The serum squamous cell carcinoma antigen level in inverted sinonasal papilloma and nasal polyps patients-ScienceDirect[J]. *World J Otorhinolaryngol Head Neck Surg*, 2021, 7(1): 23-27
- [27] Parrino D, Carraro V, Brescia G, et al. A rare case of nasal Schneiderian (inverted) papilloma associated with basaloid squamous cell carcinoma[J]. *Pathol Res Pract*, 2020, 216(7): 152999
- [28] Mclean T, Dhillon K, Lyons B, et al. Inverted papilloma of the temporal bone: recent experience and a systematic review of management [J]. *Aust J Otolaryngol*, 2021, 4(3): 23-23
- [29] Fulla M, Szafarowski T, Frias-Gomez J, et al. Human Papillomavirus and Factors Associated with Recurrence in Sinonasal Inverted Papillomas from Poland and Spain [J]. *Head Neck Pathol*, 2020, 14(3): 758-767
- [30] Ledbetter L, Cherla R, Chambers C, et al. Eosinophils Affect Antibody Isotype Switching and May Partially Contribute to Early Vaccine-Induced Immunity against *Coxiella burnetii* [J]. *Infect and Immun*, 2019, 87(11): 133-138

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- [25] Gudivada K K, Krishna B. Intensive insulin therapy and plasma exchange in hypertriglyceridaemic acute pancreatitis with multiple organ dysfunction [J]. *The National medical journal of India*, 2020, 32(9): 352-354
- [26] Yi Y, Huang Q L, Chen L, et al. Polarization phenotype of peritoneal macrophages in mice with hypertriglyceridemic acute pancreatitis[J]. *Medical Journal of Chinese People's Liberation Army*, 2020, 45(8): 810-815
- [27] Song K, Guo C R, Li C L, et al. Comparison of clinical characteristics in acute pancreatitis with and without diabetes mellitus: A retrospective study[J]. *Signa Vitae*, 2021, 17(2): 181-187
- [28] Lu W W, Chen X, Ni J L, et al. The role of gut microbiota in the pathogenesis and treatment of acute pancreatitis: a narrative review [J]. *Annals of Palliative Medicine*, 2021, 10(3): 3445-3451
- [29] Chen W, Jingjing L I, Xiao W U, et al. Analysis of medication of a pregnant woman with recurrent hyperlipidemic acute pancreatitis[J]. *Pharmaceutical Care and Research*, 2020, 20(6): 458-461
- [30] Hedegger K, F Stumpf, Blum H, et al. The protective effect of beta-cellulin against acute pancreatitis is ERBB4 dependent [J]. *Journal of Gastroenterology*, 2020, 55(3): 317-329
- [31] Minkov G, Dimitrov E, Enchev E, et al. A case of hypertriglyceridemia-induced severe acute pancreatitis - what else can be done?[J]. *Trakia Journal of Sciences*, 2020, 18(2): 125-130