

State Of The System In Patients With Hospital Respiratory Disorder Within The Background Of Chronic Nephrosis

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ABSTRACT

Purpose of the study: to check some indicators of the immunohemogram in patients with community acquired respiratory disorder on the background of CKD.

Materials and methods. one hundred twenty patients with community-acquired respiratory disorder were examined: forty patients with respiratory disorder (group Pn) and eighty respiratory disorder, that developed against the background of chronic nephrosis (group Pn+ CKD). The management cluster (CG) consisted of twenty healthy individuals. The study found that the amount of leukocytes was exaggerated within the Mon + CKD cluster by 162.24% than in the CG ($p < 0.001$), within the Mon cluster 263.14% on top of within the CG and twenty seven.79% than within the cluster Mon + CKD ($p < 0.001$). In patients with Mon, the quantitative relation of the amount of neutrophils to lymphocytes significantly exaggerated ($p < 0.001$ compared with the CG and also the Mon + CKD group), reflective the shift of the formula to the left, and within the Mon + CKD cluster this quantitative relation remained unchanged, despite the increase within the absolute variety of leukocytes. In patients with respiratory disorder with background CKD, a marked increase in T-lymphocytes was determined because of a population of CD8 and CD95 cells ($p < 0.001$ compared with CG and also the Mon group). a rise in IgM concentration prevailed within the pneumonia cluster, and a rise in immune serum globulin prevailed within the PN + CKD cluster ($p < 0.001$).

Conclusion. Respiratory disorder related to CKD is related to associate active general inflammatory response involving non-specific immunity and also the depletion of its cellular part, as well as activation of immunity because of chronic inflammation and chronic matter stimulation.

KEY WORDS: pneumonia, chronic kidney disease, cellular and humoral immunity.

1. INTRODUCTION

Community-acquired respiratory disorder is one among the foremost common causes of hospitalization. Renal lesions in illness|respiratory illness|respiratory disorder} verify the course and prognosis of the underlying disease. The severity of pneumonia is decided by 2 processes: the immune reaction and native tissue resistance [1,2]. Kidney illness, as a

pathology concomitant with respiratory disorder, is AN unfavorable issue that aggravates the prognosis of the illness, likewise because the development of complications, a lengthy and severe course, and an magnified risk of antibiotic resistance. Chronic uropathy (CKD) is related to impaired system. These changes will contribute to violations of the mechanics barrier, cause a decrease within the diffusion capability of the lungs. and exacerbation of the hypoxic state related to emerging nephritic anemia [3].

The purpose of the study was to review some indicators of the immunohemogram in patients with community-acquired respiratory disorder on the background of CKD.

2. MATERIALS AND METHODS

The study enclosed one hundred twenty patients with acute respiratory disorder. the typical age of patients was forty eight. 46 ± 3.78 years. forty patients failed to have a history of nephritic pathology (Mon group), eighty patients suffered from chronic uropathy (GFR for three months before respiratory disorder developed 30-60ml / min / one.7m², Mon cluster + CKD). As a sway cluster (CG), twenty healthy people were examined. The immune-hemogram includes the count of the cellular parts of the blood with the determination of the purposeful affiliation of the cells of the white corpuscle series by receptors on their surface and therefore the morphological and purposeful options of neutrophils, corpuscle counts were performed by flow cytometry employing a SYSMEX analyser, leucocyte reactivity and roughness and therefore the concentration of CIC binding IgG and immunoglobulin were conjointly evaluated. To identify intergroup variations, we have a tendency to used Student's confidence criterion with Bonferoni correction for multiple comparisons.

3. RESULTS AND DISCUSSION

The study discovered that the quantity of leukocytes was considerably multiplied altogether patients included within the study (Table 1), however this increase in patients of the Mon + CKD cluster was less pronounced compared with patients while not excretory organ pathology (in the Mon + CKD cluster, 162.24% higher than within the CG, $p < 0.001$; within the Mon cluster, 263.14% more than within the CG and twenty seven.79% than within the Mon + CKD cluster, $p < 0.001$ for each comparisons).

Isolation of sure kinds of leukocytes discovered the following: generally, altogether patients included within the study, the quantity of all sorts of leukocytes was considerably bigger than within the CG ($p < 0.001$). the quantity of neutrophils in patients within the Mon cluster was considerably more than not solely the CG, however conjointly the Mon + CKD cluster ($p < 0.001$), the quantity of basophils was comparable in each groups of patients, whereas lymphocytes, monocytes and eosinophils were additional multiplied in patients Mon + CKD compared with the Mon cluster. once analyzing the standard composition of the WBC series in teams of patients, shifts within the WBC formula were noted. Thus, in patients with Mon, the ratio of the quantity of neutrophils to lymphocytes considerably multiplied ($p < 0.001$ compared with CG and the Mon + CKD group), reflective a shift to the left, and within the Mon + CKD cluster remained unchanged, despite the rise within the absolute variety of leukocytes (Table. 1). a big increase within the number of neutrophils and their roughness in acute respiratory disorder may be a reflection of the activation of the innate immunity in response to lipopolysaccharide-induced stimulation of alveolar macrophages and epithelial cells [4,5]. Changes within the WBC formula in patients with Pn + CKD square measure related to impaired functioning of the innate immunologic response, that is, a universal fast response mediate by polymorphonuclear cells [6,7].

In the white corpuscle population, the quantity of reactive lymphocytes conjointly considerably multiplied, which was additional important within the Mon + CKD cluster ($p < 0.001$ compared with the CG and also the Mon group). A bigger increase within the variety and proportion of antigen-producing lymphocytes within the Mon + CKD cluster ($p < 0.001$ for each indicators compared with the CG and also the Mon group) indicates a pronounced matter stimulation of the system [7].

An assessment of the cellular immunity options discovered that the proportion of cells bearing CD3 receptors (T-lymphocytes), CD4 (T-helpers) and CD8 (T-cytotoxic and T-suppressors) was significantly multiplied in patients with Mon ($p < 0.001$ for all 3 indicators compared with CG), however, the immuno-regulation index (ratio CD4 / CD8) remained at the extent of CG. the quantity of cells bearing necrobiosis markers CD95 was conjointly considerably multiplied in patients with Mon ($p < 0.001$). Background CKD was related to a fair additional pronounced increase within the proportion of Tlymphocytes thanks to a population of CD8 and CD95 cells ($p < 0.001$ compared with CG and also the Mon group) (Table 1). This reality indicates a rise within the cytotoxic activity of the severity of necrobiosis [7.8].

The concentration of current immune complexes of immunoglobulin and IgM, as indicators of body substance immunity, was considerably multiplied altogether patients with respiratory disorder ($p < 0.001$) (Table 1). In the Mon group, a rise within the concentration of CICIgM prevailed, that indicates activation of the first immune. within the Mon + CKD cluster, a rise in CICIgG prevailed. ($p < 0.001$), a marker of the chronic immune response that's related to activation of the immunity [8,9].

Table 1. Immuno-gemogram indices in patients with acute pneumonia depending on the presence of background CKD

Indicators	Acute pyelonephritis (n=120)	Acute pyelonephritis + CKD (n=80)	Acute pyelonephritis (n=40)	KG (n=40)
White blood cells, * 10 ⁹ / l	14,90±5,24***	13,20±5,08***	18,28±3,70 ***^^^	5,04±0,85
Lymphocytes, * 10 ⁹ / L	4,56±2,75***	5,54±2,88***	2,59±0,58 ***^^^	1,72±0,40
Lymphocytes, %	32,17±16,13	41,06±12,1***	14,40±3,28 ***^^^	34,13±4,73
Reactive Lymphocytes, *10 ⁹ /L	0,26±0,29***	0,39±0,27***	0,01±0,00*** ^^	0,00±0,00
Reactive Lymphocytes, %	4,65±3,63***	6,88±2,18***	0,19±0,06^^^	0,14±0,23
Lymphocyte-producing antibodies, *10 ⁹ /L	0,10±0,12***	0,14±0,12***	0,01±0,02 ***^^^	0,00±0,00
Lymphocyte-producing antibodies, %	1,79±1,53***	2,44±1,42***	0,50±0,68*** ^^	0,08±0,13
CD3+, %	63,38±10,25***	66,75±8,62***	56,63±10,00 ***^^^	35,50±4,55
CD4+, %	27,38±7,78***	27,56±8,85***	27,03±5,06** *	20,25±2,73

CD8+, %	35,99±12,57***	39,19±12,27** *	29,60±10,67 ***^^^	15,25±2,1 0
IRI	1,13±1,66	1,14±1,99	1,11±0,62	1,33±0,12
CD95+, %	29,66±6,89***	31,50±7,18***	25,98±4,45 ***^^^	21,10±3,6 3
Neutrophils, *10 ⁹ /L	9,14±4,98***	6,29±2,69***	14,85±3,32 ***^^^	2,99±0,55
Neutrophils, %	59,12±18,02	48,24±10,87** *	80,87±4,79 ***^^^	59,47±4,9 3
Monocytes, *10 ⁹ /L	0,74±0,47***	0,90±0,50***	0,42±0,15 ***^^^	0,22±0,09
Monocytes, %	5,52±3,86*	7,12±3,79***	2,33±0,79 ***^^^	4,43±1,67
Eosinophils, *10 ⁹ /L	0,27±0,16***	0,29±0,19***	0,22±0,05*** ^	0,06±0,04
Eosinophils, %	1,93±1,33*	2,27±1,50**	1,26±0,37^^^	1,26±0,96
Basophils, *10 ⁹ /L	0,19±0,23***	0,18±0,23***	0,20±0,23***	0,04±0,04
Basophils, %	1,26±1,44*	1,32±1,42*	1,15±1,50	0,71±0,71
Neutrophils / Lymphocytes	3,02±2,53***	1,59±1,65	5,87±1,19 ***^^^	1,79±0,39
CEC IgG	52,34±28,89***	65,79±26,38** *	25,45±4,97 ***^^^	13,85±4,5 0
CEC IgM	41,78±21,18***	30,05±12,84** *	65,25±13,70 ***^^^	15,50±9,1 5

Note: * - significance of differences with CG, ^ - significance of differences with the group of OP + CKD. One character - p <0.05, two characters - p <0.01, three characters - p <0.001.

4. CONCLUSION

Thus, the current study showed that acute respiratory disorder related to CKD was related to a lot of important response of such subpopulations of leukocytes as lymphocytes, monocytes, and eosinophils. In patients with Pn + CKD, as compared with patients while not background pathology, a hyperactive general inflammatory reaction was ascertained involving non-specific (innate) immunity and depletion of its cellular element, likewise as activation of resistance because of chronic inflammation and chronic substance stimulation.

REFERENCES

- [1] Kant, N., Saralch, S., & Singh, H. (2011). Ponderomotive self-focusing of a short laser pulse under a plasma density ramp. *Nukleonika*, 56, 149-153.
- [2] Patyar, S., & Patyar, R. R. (2015). Correlation between sleep duration and risk of stroke. *Journal of Stroke and Cerebrovascular Diseases*, 24(5), 905-911.
- [3] Khamparia, A., & Pandey, B. (2015). Knowledge and intelligent computing methods in e-learning. *International Journal of technology enhanced learning*, 7(3), 221-242.
- [4] Singh, A., Lin, Y., Quraishi, M. A., Olasunkanmi, L. O., Fayemi, O. E., Sasikumar, Y., ... & Kabanda, M. M. (2015). Porphyrins as corrosion inhibitors for N80 Steel in 3.5%

- NaCl solution: Electrochemical, quantum chemical, QSAR and Monte Carlo simulations studies. *Molecules*, 20(8), 15122-15146.
- [5] Singh, S., Kumar, V., Upadhyay, N., Singh, J., Singla, S., & Datta, S. (2017). Efficient biodegradation of acephate by *Pseudomonas pseudoalcaligenes* PS-5 in the presence and absence of heavy metal ions [Cu (II) and Fe (III)], and humic acid. *3 Biotech*, 7(4), 262.
- [6] Mia, M., Singh, G., Gupta, M. K., & Sharma, V. S. (2018). Influence of Ranque-Hilsch vortex tube and nitrogen gas assisted MQL in precision turning of Al 6061-T6. *Precision Engineering*, 53, 289-299.
- [7] Prakash, C., Singh, S., Pabla, B. S., & Uddin, M. S. (2018). Synthesis, characterization, corrosion and bioactivity investigation of nano-HA coating deposited on biodegradable Mg-Zn-Mn alloy. *Surface and Coatings Technology*, 346, 9-18.
- [8] Feng, X., Sureda, A., Jafari, S., Memariani, Z., Tewari, D., Annunziata, G., ... & Sychrová, A. (2019). Berberine in cardiovascular and metabolic diseases: from mechanisms to therapeutics. *Theranostics*, 9(7), 1923.
- [9] Bashir, S., Sharma, V., Lgaz, H., Chung, I. M., Singh, A., & Kumar, A. (2018). The inhibition action of analgin on the corrosion of mild steel in acidic medium: A combined theoretical and experimental approach. *Journal of Molecular Liquids*, 263, 454-462.
- [10] Sidhu, G. K., Singh, S., Kumar, V., Dhanjal, D. S., Datta, S., & Singh, J. (2019). Toxicity, monitoring and biodegradation of organophosphate pesticides: a review. *Critical Reviews in Environmental Science and Technology*, 49(13), 1135-1187.
- [11] Nanda, V., & Kant, N. (2014). Enhanced relativistic self-focusing of Hermite-cosh-Gaussian laser beam in plasma under density transition. *Physics of Plasmas*, 21(4), 042101.
- [12] Kotla, N. G., Gulati, M., Singh, S. K., & Shivapooja, A. (2014). Facts, fallacies and future of dissolution testing of polysaccharide based colon-specific drug delivery. *Journal of Controlled Release*, 178, 55-62.
- [13] Farooq, R., & Shankar, R. (2016). Role of structural equation modeling in scale development. *Journal of Advances in Management Research*.
- [14] Singh, S., Ramakrishna, S., & Gupta, M. K. (2017). Towards zero waste manufacturing: A multidisciplinary review. *Journal of cleaner production*, 168, 1230-1243.
- [15] Mahla, S. K., Dhir, A., Gill, K. J., Cho, H. M., Lim, H. C., & Chauhan, B. S. (2018). Influence of EGR on the simultaneous reduction of NO_x-smoke emissions trade-off under CNG-biodiesel dual fuel engine. *Energy*, 152, 303-312.
- [16] Nanda, V., Kant, N., & Wani, M. A. (2013). Self-focusing of a Hermite-cosh Gaussian laser beam in a magnetoplasma with ramp density profile. *Physics of Plasmas*, 20(11), 113109.
- [17] Kaur, P., Singh, S. K., Garg, V., Gulati, M., & Vaidya, Y. (2015). Optimization of spray drying process for formulation of solid dispersion containing polypeptide-k powder through quality by design approach. *Powder Technology*, 284, 1-11.
- [18] Sharma, D., & Saharan, B. S. (2016). Functional characterization of biomedical potential of biosurfactant produced by *Lactobacillus helveticus*. *Biotechnology Reports*, 11, 27-35.
- [19] Wani, A. B., Chadar, H., Wani, A. H., Singh, S., & Upadhyay, N. (2017). Salicylic acid to decrease plant stress. *Environmental Chemistry Letters*, 15(1), 101-123.
- [20] Mishra, V., Patil, A., Thakur, S., & Kesharwani, P. (2018). Carbon dots: emerging theranostic nanoarchitectures. *Drug discovery today*, 23(6), 1219-1232.

- [21] Kumar, V., Pitale, S. S., Mishra, V., Nagpure, I. M., Biggs, M. M., Ntwaeaborwa, O. M., & Swart, H. C. (2010). Luminescence investigations of Ce³⁺ doped CaS nanophosphors. *Journal of alloys and compounds*, 492(1-2), L8-L12.
- [22] Pudake, R. N., Swaminathan, S., Sahu, B. B., Leandro, L. F., & Bhattacharyya, M. K. (2013). Investigation of the *Fusariumvirguliformefvtox1* mutants revealed that the FvTox1 toxin is involved in foliar sudden death syndrome development in soybean. *Current genetics*, 59(3), 107-117.
- [23] Kapoor, B., Singh, S. K., Gulati, M., Gupta, R., & Vaidya, Y. (2014). Application of liposomes in treatment of rheumatoid arthritis: quo vadis. *The scientific world Journal*, 2014.
- [24] Haldhar, R., Prasad, D., & Saxena, A. (2018). Myristica fragrans extract as an eco-friendly corrosion inhibitor for mild steel in 0.5 M H₂SO₄ solution. *Journal of Environmental Chemical Engineering*, 6(2), 2290-2301.
- [25] Bordoloi, N., Sharma, A., Nautiyal, H., & Goel, V. (2018). An intense review on the latest advancements of Earth Air Heat Exchangers. *Renewable and Sustainable Energy Reviews*, 89, 261-280.
- [26] Sharma, P., Mehta, M., Dhanjal, D. S., Kaur, S., Gupta, G., Singh, H., ... & Chellappan, D. K. (2019). Emerging trends in the novel drug delivery approaches for the treatment of lung cancer. *Chemico-biological interactions*, 309, 108720.
- [27] Goga, G., Chauhan, B. S., Mahla, S. K., & Cho, H. M. (2019). Performance and emission characteristics of diesel engine fueled with rice bran biodiesel and n-butanol. *Energy Reports*, 5, 78-83.
- [28] Umashankar, M. S., Sachdeva, R. K., & Gulati, M. (2010). Aquasomes: a promising carrier for peptides and protein delivery. *Nanomedicine: Nanotechnology, Biology and Medicine*, 6(3), 419-426.
- [29] Sharma, A., Shree, V., & Nautiyal, H. (2012). Life cycle environmental assessment of an educational building in Northern India: A case study. *Sustainable Cities and Society*, 4, 22-28.
- [30] Kaur, T., Kumar, S., Bhat, B. H., Want, B., & Srivastava, A. K. (2015). Effect on dielectric, magnetic, optical and structural properties of Nd-Co substituted barium hexaferrite nanoparticles. *Applied Physics A*, 119(4), 1531-1540.
- [31] Datta, S., Singh, J., Singh, S., & Singh, J. (2016). Earthworms, pesticides and sustainable agriculture: a review. *Environmental Science and Pollution Research*, 23(9), 8227-8243.
- [32] Vij, S., & Bedi, H. S. (2016). Are subjective business performance measures justified?. *International Journal of Productivity and Performance Management*.
- [33] Chawla, R., & Sharma, S. (2017). Molecular dynamics simulation of carbon nanotube pull-out from polyethylene matrix. *Composites Science and Technology*, 144, 169-177.
- [34] Prakash, C., & Uddin, M. S. (2017). Surface modification of β -phase Ti implant by hydroxyapatite mixed electric discharge machining to enhance the corrosion resistance and in-vitro bioactivity. *Surface and Coatings Technology*, 326, 134-145.
- [35] Saxena, A., Prasad, D., & Haldhar, R. (2018). Investigation of corrosion inhibition effect and adsorption activities of *Cuscuta reflexa* extract for mild steel in 0.5 M H₂SO₄. *Bioelectrochemistry*, 124, 156-164.
- [36] Prabhakar, P. K., Kumar, A., & Doble, M. (2014). Combination therapy: a new strategy to manage diabetes and its complications. *Phytomedicine*, 21(2), 123-130.
- [37] Wheeler, K. C., Jena, M. K., Pradhan, B. S., Nayak, N., Das, S., Hsu, C. D., ... & Nayak, N. R. (2018). VEGF may contribute to macrophage recruitment and M2 polarization in the decidua. *PLoS One*, 13(1), e0191040.

- [38] Singh, A., Lin, Y., Ansari, K. R., Quraishi, M. A., Ebenso, E. E., Chen, S., & Liu, W. (2015). Electrochemical and surface studies of some Porphines as corrosion inhibitor for J55 steel in sweet corrosion environment. *Applied Surface Science*, 359, 331-339.
- [39] Gill, J. P. K., Sethi, N., Mohan, A., Datta, S., & Girdhar, M. (2018). Glyphosate toxicity for animals. *Environmental Chemistry Letters*, 16(2), 401-426.
- [40] Kumar, V., Singh, S., Singh, J., & Upadhyay, N. (2015). Potential of plant growth promoting traits by bacteria isolated from heavy metal contaminated soils. *Bulletin of environmental contamination and toxicology*, 94(6), 807-814.
- [41] Patel, S. (2012). Potential of fruit and vegetable wastes as novel biosorbents: summarizing the recent studies. *Reviews in Environmental Science and Bio/Technology*, 11(4), 365-380.
- [42] Srivastava, G., Das, C. K., Das, A., Singh, S. K., Roy, M., Kim, H., ... & Philip, D. (2014). Seed treatment with iron pyrite (FeS₂) nanoparticles increases the production of spinach. *RSC Advances*, 4(102), 58495-58504.
- [43] Nagpal, R., Behare, P. V., Kumar, M., Mohania, D., Yadav, M., Jain, S., ... & Henry, C. J. K. (2012). Milk, milk products, and disease free health: an updated overview. *Critical reviews in food science and nutrition*, 52(4), 321-333.
- [44] Vaid, S. K., Kumar, B., Sharma, A., Shukla, A. K., & Srivastava, P. C. (2014). Effect of Zn solubilizing bacteria on growth promotion and Zn nutrition of rice. *Journal of soil science and plant nutrition*, 14(4), 889-910.
- [45] Lin, Y., Singh, A., Ebenso, E. E., Wu, Y., Zhu, C., & Zhu, H. (2015). Effect of poly (methyl methacrylate-co-N-vinyl-2-pyrrolidone) polymer on J55 steel corrosion in 3.5% NaCl solution saturated with CO₂. *Journal of the Taiwan Institute of Chemical Engineers*, 46, 214-222.
- [46] Mahesh, K. V., Singh, S. K., & Gulati, M. (2014). A comparative study of top-down and bottom-up approaches for the preparation of nanosuspensions of glipizide. *Powder technology*, 256, 436-449.
- [47] Singh, G., Gupta, M. K., Mia, M., & Sharma, V. S. (2018). Modeling and optimization of tool wear in MQL-assisted milling of Inconel 718 superalloy using evolutionary techniques. *The International Journal of Advanced Manufacturing Technology*, 97(1-4), 481-494.
- [48] Chauhan, C. C., Kagdi, A. R., Jotania, R. B., Upadhyay, A., Sandhu, C. S., Shirsath, S. E., & Meena, S. S. (2018). Structural, magnetic and dielectric properties of Co-Zr substituted M-type calcium hexagonal ferrite nanoparticles in the presence of α -Fe₂O₃ phase. *Ceramics International*, 44(15), 17812-17823.
- [49] Sharma, A., Shahzad, B., Kumar, V., Kohli, S. K., Sidhu, G. P. S., Bali, A. S., ... & Zheng, B. (2019). Phytohormones regulate accumulation of osmolytes under abiotic stress. *Biomolecules*, 9(7), 285.
- [50] Balakumar, P., Chakkarwar, V. A., Kumar, V., Jain, A., Reddy, J., & Singh, M. (2008). Experimental models for nephropathy. *Journal of the Renin-Angiotensin-Aldosterone System*, 9(4), 189-195.
- [51] Singh, A., Lin, Y., Liu, W., Kuanhai, D., Pan, J., Huang, B., ... & Zeng, D. (2014). A study on the inhibition of N80 steel in 3.5% NaCl solution saturated with CO₂ by fruit extract of *Gingko biloba*. *Journal of the Taiwan Institute of Chemical Engineers*, 45(4), 1918-1926.
- [52] Kaur, T., Kaur, B., Bhat, B. H., Kumar, S., & Srivastava, A. K. (2015). Effect of calcination temperature on microstructure, dielectric, magnetic and optical properties of Ba_{0.7}La_{0.3}Fe₁₁Co_{0.7}O₁₉ hexaferrites. *Physica B: Condensed Matter*, 456, 206-212.

- [53] Singh, P., Singh, A., & Quraishi, M. A. (2016). Thiopyrimidine derivatives as new and effective corrosion inhibitors for mild steel in hydrochloric acid: Electrochemical and quantum chemical studies. *Journal of the Taiwan Institute of Chemical Engineers*, 60, 588-601.
- [54] Anand, A., Patience, A. A., Sharma, N., & Khurana, N. (2017). The present and future of pharmacotherapy of Alzheimer's disease: A comprehensive review. *European journal of pharmacology*, 815, 364-375.
- [55] Saxena, A., Prasad, D., Haldhar, R., Singh, G., & Kumar, A. (2018). Use of *Sida cordifolia* extract as green corrosion inhibitor for mild steel in 0.5 M H₂SO₄. *Journal of environmental chemical engineering*, 6(1), 694-700.
- [56] Ahmadi, M. H., Ghazvini, M., Sadeghzadeh, M., Alhuyi Nazari, M., Kumar, R., Naeimi, A., & Ming, T. (2018). Solar power technology for electricity generation: A critical review. *Energy Science & Engineering*, 6(5), 340-361.
- [57] Kant, N., Wani, M. A., & Kumar, A. (2012). Self-focusing of Hermite–Gaussian laser beams in plasma under plasma density ramp. *Optics Communications*, 285(21-22), 4483-4487.
- [58] Gupta, V. K., Sethi, B., Upadhyay, N., Kumar, S., Singh, R., & Singh, L. P. (2011). Iron (III) selective electrode based on S-methyl N-(methylcarbamoyloxy) thioacetimidate as a sensing material. *Int. J. Electrochem. Sci*, 6, 650-663.
- [59] Mehta, C. M., Srivastava, R., Arora, S., & Sharma, A. K. (2016). Impact assessment of silver nanoparticles on plant growth and soil bacterial diversity. *3 Biotech*, 6(2), 254.
- [60] Gupta, V. K., Guo, C., Canever, M., Yim, H. R., Sraw, G. K., & Liu, M. (2014). Institutional environment for entrepreneurship in rapidly emerging major economies: the case of Brazil, China, India, and Korea. *International Entrepreneurship and Management Journal*, 10(2), 367-384.
- [61] Singh, A., Lin, Y., Obot, I. B., Ebenso, E. E., Ansari, K. R., & Quraishi, M. A. (2015). Corrosion mitigation of J55 steel in 3.5% NaCl solution by a macrocyclic inhibitor. *Applied Surface Science*, 356, 341-347.
- [62] Ansari, K. R., Quraishi, M. A., Singh, A., Ramkumar, S., & Obote, I. B. (2016). Corrosion inhibition of N80 steel in 15% HCl by pyrazolone derivatives: electrochemical, surface and quantum chemical studies. *RSC advances*, 6(29), 24130-24141.
- [63] Jnawali, P., Kumar, V., & Tanwar, B. (2016). Celiac disease: Overview and considerations for development of gluten-free foods. *Food Science and Human Wellness*, 5(4), 169-176.
- [64] Saggu, S., Sakeran, M. I., Zidan, N., Tousson, E., Mohan, A., & Rehman, H. (2014). Ameliorating effect of chicory (*Chichorium intybus* L.) fruit extract against 4-tert-octylphenol induced liver injury and oxidative stress in male rats. *Food and chemical toxicology*, 72, 138-146.
- [65] Bhatia, A., Singh, B., Raza, K., Wadhwa, S., & Katare, O. P. (2013). Tamoxifen-loaded lecithin organogel (LO) for topical application: development, optimization and characterization. *International Journal of Pharmaceutics*, 444(1-2), 47-59.
- [66] Singh, A., Lin, Y., Liu, W., Yu, S., Pan, J., Ren, C., & Kuanhai, D. (2014). Plant derived cationic dye as an effective corrosion inhibitor for 7075 aluminum alloy in 3.5% NaCl solution. *Journal of Industrial and Engineering Chemistry*, 20(6), 4276-4285.
- [67] Raza, K., Thotakura, N., Kumar, P., Joshi, M., Bhushan, S., Bhatia, A., ... & Katare, O. P. (2015). C60-fullerenes for delivery of docetaxel to breast cancer cells: a promising approach for enhanced efficacy and better pharmacokinetic profile. *International journal of pharmaceutics*, 495(1), 551-559.

- [68] Prabhakar, P. K., Prasad, R., Ali, S., & Doble, M. (2013). Synergistic interaction of ferulic acid with commercial hypoglycemic drugs in streptozotocin induced diabetic rats. *Phytomedicine*, 20(6), 488-494.
- [69] Chaudhary, A., & Singh, S. S. (2012, September). Lung cancer detection on CT images by using image processing. In *2012 International Conference on Computing Sciences* (pp. 142-146). IEEE.
- [70] Mishra, V., Bansal, K. K., Verma, A., Yadav, N., Thakur, S., Sudhakar, K., & Rosenholm, J. M. (2018). Solid lipid nanoparticles: Emerging colloidal nano drug delivery systems. *Pharmaceutics*, 10(4), 191.
- [71] Singh, A. (2012). Hydroxyapatite, a biomaterial: its chemical synthesis, characterization and study of biocompatibility prepared from shell of garden snail, *Helix aspersa*. *Bulletin of Materials Science*, 35(6), 1031-1038.
- [72] Arora, S., & Anand, P. (2019). Binary butterfly optimization approaches for feature selection. *Expert Systems with Applications*, 116, 147-160.
- [73] Chhikara, N., Kushwaha, K., Sharma, P., Gat, Y., & Panghal, A. (2019). Bioactive compounds of beetroot and utilization in food processing industry: A critical review. *Food Chemistry*, 272, 192-200.
- [74] Singh, S., Kumar, V., Chauhan, A., Datta, S., Wani, A. B., Singh, N., & Singh, J. (2018). Toxicity, degradation and analysis of the herbicide atrazine. *Environmental chemistry letters*, 16(1), 211-237.
- [75] Baranwal, T., & Pateriya, P. K. (2016, January). Development of IoT based smart security and monitoring devices for agriculture. In *2016 6th International Conference-Cloud System and Big Data Engineering (Confluence)* (pp. 597-602). IEEE.
- [76] Trukhanov, S. V., Trukhanov, A. V., Salem, M. M., Trukhanova, E. L., Panina, L. V., Kostishyn, V. G., ... & Sivakov, V. (2018). Preparation and investigation of structure, magnetic and dielectric properties of (BaFe₁₁. 9Al₀. 1O₁₉) 1-x-(BaTiO₃) x bicomponent ceramics. *Ceramics International*, 44(17), 21295-21302.
- [77] Singh, S., Singh, N., Kumar, V., Datta, S., Wani, A. B., Singh, D., ... & Singh, J. (2016). Toxicity, monitoring and biodegradation of the fungicide carbendazim. *Environmental chemistry letters*, 14(3), 317-329.
- [78] Bhyan, B., Jangra, S., Kaur, M., & Singh, H. (2011). Orally fast dissolving films: innovations in formulation and technology. *Int J Pharm Sci Rev Res*, 9(2), 9-15.
- [79] Saxena, A., Prasad, D., Haldhar, R., Singh, G., & Kumar, A. (2018). Use of Saraca ashoka extract as green corrosion inhibitor for mild steel in 0.5 M H₂SO₄. *Journal of Molecular Liquids*, 258, 89-97.
- [80] Panghal, A., Janghu, S., Virkar, K., Gat, Y., Kumar, V., & Chhikara, N. (2018). Potential non-dairy probiotic products—A healthy approach. *Food bioscience*, 21, 80-89.
- [81] Kumar, D., Agarwal, G., Tripathi, B., Vyas, D., & Kulshrestha, V. (2009). Characterization of PbS nanoparticles synthesized by chemical bath deposition. *Journal of Alloys and Compounds*, 484(1-2), 463-466.
- [82] Ansari, K. R., Quraishi, M. A., & Singh, A. (2015). Corrosion inhibition of mild steel in hydrochloric acid by some pyridine derivatives: an experimental and quantum chemical study. *Journal of Industrial and Engineering Chemistry*, 25, 89-98.
- [83] Singh, P. S., Singh, T., & Kaur, P. (2008). Variation of energy absorption buildup factors with incident photon energy and penetration depth for some commonly used solvents. *Annals of Nuclear Energy*, 35(6), 1093-1097.
- [84] Ansari, K. R., Quraishi, M. A., & Singh, A. (2015). Isatin derivatives as a non-toxic corrosion inhibitor for mild steel in 20% H₂SO₄. *Corrosion Science*, 95, 62-70.

- [85] Singh, A., Lin, Y., Ebenso, E. E., Liu, W., Pan, J., & Huang, B. (2015). Ginkgo biloba fruit extract as an eco-friendly corrosion inhibitor for J55 steel in CO₂ saturated 3.5% NaCl solution. *Journal of Industrial and Engineering Chemistry*, 24, 219-228.
- [86] Dey, A., Bhattacharya, R., Mukherjee, A., & Pandey, D. K. (2017). Natural products against Alzheimer's disease: Pharmaco-therapeutics and biotechnological interventions. *Biotechnology Advances*, 35(2), 178-216.
- [87] Ansari, K. R., Quraishi, M. A., & Singh, A. (2015). Pyridine derivatives as corrosion inhibitors for N80 steel in 15% HCl: Electrochemical, surface and quantum chemical studies. *Measurement*, 76, 136-147.
- [88] Patel, S. (2012). Threats, management and envisaged utilizations of aquatic weed *Eichhornia crassipes*: an overview. *Reviews in Environmental Science and Bio/Technology*, 11(3), 249-259.
- [89] Mia, M., Gupta, M. K., Singh, G., Królczyk, G., & Pimenov, D. Y. (2018). An approach to cleaner production for machining hardened steel using different cooling-lubrication conditions. *Journal of Cleaner Production*, 187, 1069-1081.
- [90] Kondrateva T.S. Biopharmaceutical studies of children's suppositories with phosphothiamine. Pharmacy.-Moscow, 1990.-No.5.-P.14-15.
- [91] Maksudova F.Kh., Kariyeva E.S., Tursunova M.Kh. Study of the pharmacological properties of the combined gel of sodium diclofenac and benzketozone. /Infection, immunity and pharmacologists I.- Tashkent.-2015.-№5.C.160-163 /
- [92] Maksudova F. Kh., Kariyeva E. S. In vitro equivalence evaluation of diclofenac sodium generic medicinal preparation. // Pharmacy, a scientific and practical journal, special issue, St. Petersburg, 2016, pp. 461-464.
- [93] Piotrovsky V.K. Model and model-independent methods for describing pharmacokinetics: advantages, disadvantages and interrelation. // Antibiotics and medical biotechnology. -Moscow, 1997.-№7.P.492-497.
- [94] Kukes V.G., Sychev D.A. Clinical pharmacology. 5th ed., Moscow, 2017, p. 478.
- [95] Tillaeva U. M., Azizov U. M. Development of a methodology for isolating the amount of fensulcal determination from a biological object. Materials of the scientific-practical conference "Actual issues of education, science and production in pharmacy. Tashkent, 2009.-P.172 .
- [96] Tillaeva U.M. Standardization and quality control of fensulcal in soft dosage forms. // Authors' dissertation for the study of the academician of the candidate of pharmaceuticals. Sciences . Tashkent. 2011.23 s.
- [97] Golovkin V.A. On the importance of pharmacokinetics modeling for increasing the efficiency of biopharmaceutical research. // Optimization of drug supply and ways to increase the effectiveness of pharmaceutical science : Sat. Tez.dokl.-Kharkov, 1986.-P.61-62.
- [98] Stefanova A.V. Preclinical studies of medicines. Kiev. -2002. -650 p.
- [99] Jain S. et al. Community-acquired pneumonia requiring hospitalization among US adults //New England Journal of Medicine. – 2015. – T. 373. – №. 5. – C. 415-427.
- [100] Community acquired pneumonia guidelines//Infectious Disease Advisor.-January 08, 2018.
- [101] Dalrymple L. S. et al. The risk of infection-related hospitalization with decreased kidney function //American journal of kidney diseases. – 2012. – T. 59. – №. 3. – C. 356-363.
- [102] Kamata H. et al. Epithelial cell-derived secreted and transmembrane 1a signals to activated neutrophils during pneumococcal pneumonia //American journal of respiratory cell and molecular biology. – 2016. – T. 55. – №. 3. – C. 407-418.

- [103]Quinton L. J., Mizgerd J. P. Dynamics of lung defense in pneumonia: resistance, resilience, and remodeling //Annual review of physiology. – 2015. – T. 77. – C. 407-430.
- [104]Viasus D. et al. Epidemiology, clinical features and outcomes of pneumonia in patients with chronic kidney disease //Nephrology Dialysis Transplantation. – 2011. – T. 26. – №. 9. – C. 2899-2906.
- [105]Medzhitov R., Janeway Jr C. A. Innate immunity: impact on the adaptive immune response //Current opinion in immunology. – 1997. – T. 9. – №. 1. – C. 4-9.
- [106]Kotton DN, Morrisey EE. Lung regeneration: mechanisms, applications and emerging stem cell populations. Nat Med. 2014;20:822–832.
- [107]Linkermann A. et al. Regulated cell death and inflammation: an auto-amplification loop causes organ failure //Nature Reviews Immunology. – 2014. – T. 14. – №. 11. – C. 759-767.
- [108]Dalrymple L. S. et al. The risk of infection-related hospitalization with decreased kidney function //American journal of kidney diseases. – 2012. – T. 59. – №. 3. – C. 356-363 .