INJ INTERNATIONAL NEUROUROLOGY JOURNAL

Systematic examination of neurological problems such as Guillain-Barré and myasthenia gravis in children and adults involved in infection with the help of radiological and pharmaceutical techniques

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Abstract

In the present study, a systematic investigation of neurological problems such as Guillain-Barré and myasthenia gravis in children and adults involved in infection with the help of radiological and pharmaceutical techniques has been done. This disease is in the category of autoimmune diseases, which is associated with acute nerve and muscle failure. The results of the present study show that among the first and most obvious signs and symptoms of Guillain-Barre syndrome are the tingling in the legs and the presence of weakness in them. In acute cases, these problems gradually cause paralysis of the whole body. These symptoms can have an upward trend for 2 to 4 weeks. Myasthenia gravis, whose name is composed of two words, myasthenia, which means muscle weakness, and gravis, which means heavy or severe, is an autoimmune disorder in which the body's defense system attacks its own tissues and causes muscle weakness of varying degrees in people. and it is difficult to recognize. The results of the present study indicate that in myasthenia gravis, the immune system produces antibodies that block and destroy many of the neurotransmitter receptor sites called acetylcholine. By reducing the number of available receptor sites, the muscles receive fewer nerve signals, resulting in weakness. Antibodies also block the action of a protein called tyrosine kinase, which is a muscle-specific receptor. This protein plays a role in the formation of the neuromuscular junction. Antibodies that disrupt this protein can lead to myasthenia gravis.

Key words: Guillain-Barré, myasthenia gravis, infection, radiology and drug techniques, nerve signal.

Introduction

Disorders that affect the brain, spinal cord, and nerves are called neurological disorders [1]. The most common symptoms of neurological disorders include all types of pain [2], including headache and back pain. Disruption in the entire nervous system or a part of it can lead to several symptoms [3]. Because the nervous system controls various functions of the body. The proper functioning of muscles, skin sensation, special senses (sight, taste, smell and hearing) and other senses depend on the nervous system [4]. Therefore, neurological symptoms can include muscle weakness or lack of coordination, abnormal sensations in the skin, and impaired vision, taste, smell, and hearing. In addition, neurological disorders can interfere with a person's sleep. Neurological symptoms may be minor, such as tingling in the legs, or dangerous and serious, such as coma due to a stroke [5]. Symptoms can include all types of pain and affect muscle function, sensation, special senses (sight, taste, smell, and hearing), sleep, awareness, and mental function (Figure 1).

ISSN:2093-4777 | E-ISSN:2093-6931
DOI: 10.5123/inj.2024.1.inj92
Vol. 28 Iss. 1 (2024)

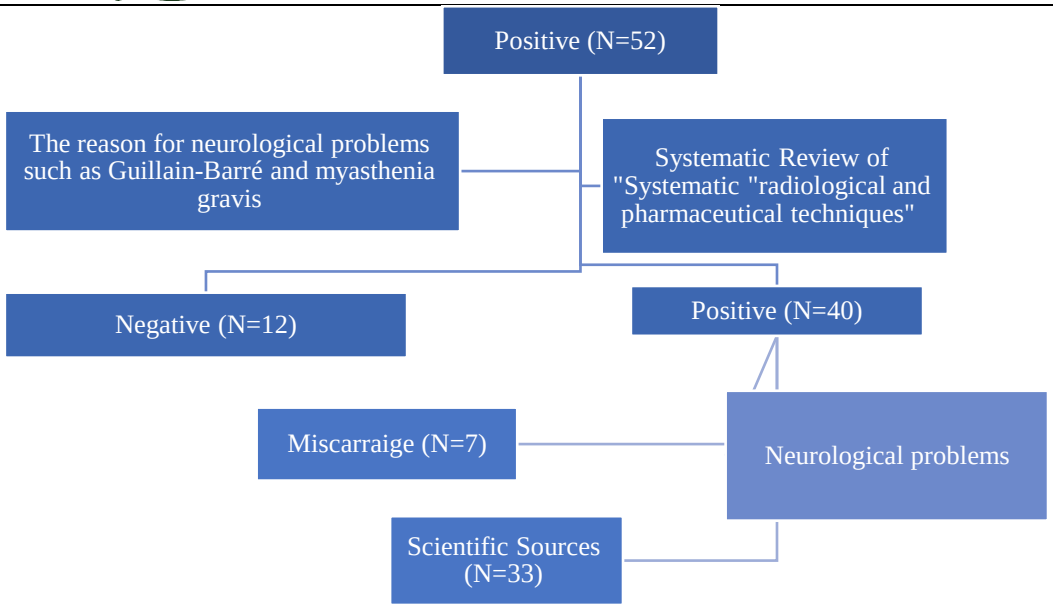

Figure 1. Flow chart of included subjects

You are in Guaris

Myasthenia gravis with the symbol MG in neurology is a type of muscle paralysis caused by immune activity against acetylcholine receptor proteins in the neuromuscular synapse [6-8]. This disease is specific to the end plates of the striated muscles, which affects mostly women. Its maximum prevalence is in the third or fourth decades of life [9-11], but it can be seen in any period of life from childhood to old age. Of course, in elderly people, men and women are equally affected. The symptom of myasthenia gravis is muscle weakness that increases during activity and decreases during rest. Eye control, eyelid movement, facial expression, chewing, speaking, and swallowing are often impaired [12]. Also, the respiratory muscles and the muscles of the lower parts of the body may also be affected. Although myasthenia gravis can affect any voluntary muscle, it most commonly affects the muscles that control the eyes, swallowing, eyelid movement, and facial expression [13]. These symptoms are often not immediately diagnosed as myasthenia gravis, and the diagnosis of this disease may take more than a year. In most cases, the first symptom of the disease is the weakness of the eye muscles, which also causes double vision. In other cases, difficulty in swallowing or speaking disorder may be the first signs of this disease. The degree of intensity and weakness of the muscles involved in myasthenia gravis has major differences between different patients, which ranges from a point or limited to the eye muscles (ocular myasthenia) to a major part of the muscles [1], sometimes including the respiratory muscles, in severe cases. In critical myasthenia gravis, the disease may lead to limb paralysis. In myasthenia gravis, there appears to be an immunological response against one or more proteins of the neuromuscular junction [14]. Therefore, in connective tissue diseases such as rheumatoid arthritis and lupus, this disease occurs more frequently [15].

Guillain-Barre syndrome diagnosis criteria:

There are two main criteria that must be present to diagnose this syndrome. Contains:

- ***Progressive weakness of the legs and arms:*** in the classic form, it starts from the legs and goes up, but sometimes it starts from the arms and is downward. In the early stages of the disease, there may be asymmetric weakness, but in the establishment phase of the disease, it is definitely symmetrical. In case of asymmetry in the establishment phase, the diagnosis should be doubted.
- ***Areflexia:*** loss of tendon reflexes is one of the prominent points in the diagnosis of Guillain-Barre syndrome. Exceptionally, reflexes may remain in the early stages of the disease. Reflexes remain in the autonomic pandis form, which is one of the exceptions [16].

There are other clinical manifestations that help in the diagnosis of this syndrome:

- The progression of the disease is within a few days to 4 weeks. If the symptoms progress after 4 weeks, it is probably not Gilenbare.
- Weakness is almost symmetrical.
- There are sensory signs and symptoms, but they are not prominent, and what the patient complains about and refers to because of it is motor weakness [17].
- There is cranial nerve involvement. Up to 50% of cases, fascial involvement may be seen (especially the bilateral form of fascial involvement).
- Normally, within 2-4 weeks after the establishment of the disease, the recovery period begins. Usually, the disease has an ascending course of 2 weeks, a plateau period of 2-4 weeks, and then a recovery period.
- Findings of autonomic involvement are common and important. Hypo and hypertension may occur. Tachycardia is also common and fatal bradycardia may occur.
- The onset of fever at the beginning of the disease is inconsistent with the diagnosis of Guillain-Barre syndrome. Of course, in 75-80% of cases, there is a prodrome with fever. But at the time of the onset of this syndrome, the initial prodrome disease has improved [18].

Other neuropathies such as porphyria, arsenic poisoning, organophosphate poisoning may also cause acute flaccid paralysis. The difference between them and Guillain-Barré syndrome is that in Guillain-Barré syndrome there is a prodromal disease. Also, the proprioceptive disorder that is common and severe in Glenbare is usually not seen in other neuropathies. Guillain-Barre type (it is demyelinating and other neuropathies are usually axonal type. Therefore, their NCS findings are also different) [19].

Botulism can be mentioned among the fatal neuromuscular disorders. In botulism, by inhibiting calcium channels in the presynaptic part of the neuromuscular junction, the resulting toxin inhibits the release of acetylcholine and causes acute flaccid paralysis [20].

Usually, there is a history of consuming canned food in this disease. However, sometimes this record is not obtained. In botulism, autonomic disorders are very common and usually start from the eyes. These patients never experience complete areflexia [21].

The most common cause of myopathy in emergency is hypokalemia. Blood potassium should be checked in every patient with acute flaccid paralysis. These patients usually have a history of previous attacks as well as a family history. Sometimes it may be the first attack (first and third decade of life). Usually, after consuming a starchy meal and resting after that, the patient is unable to get up. In myopathies, there is no areflexia despite the obvious weakness [22]. Two points are important.

1- Spectral disorder is not common and severe in Guillain-bare, but urinary and fecal incontinence is complete in spinal shock [23].
2- The patient with spinal disorder has a distinct sensory level, the upper and lower areas of this level are completely different from each other. This situation does not exist in Gilenbare [24].

Discussion

Research shows that the coronavirus can cause neuromuscular disorders in people who have no previous history. In addition, the virus can cause exacerbation of symptoms in patients with existing disorders and patients undergoing immunotherapy [25].

Symptoms of myasthenia gravis

Having this condition is associated with signs and symptoms. At the beginning of the disease, the muscles are gradually weakened and aggravated by performing activities during the day. At the beginning of the disease [26], this muscle weakness is usually less at the beginning of the day and becomes worse at night [27]. Weakness and failure of each muscle leads to many hardships and problems.

1- Weakness of the eye muscles: In most people with the problem of weakening the eye muscles, the muscles around the eyes are weakened and cause problems such as double vision and drooping eyelids in people. By doing things like watching TV [28], driving, and studying, these muscles become weaker and cause more problems. To reduce the damage caused by these activities, using sunglasses can be a good option [29].

2- Weakness of the throat muscles and difficulty in swallowing: With the weakening of the swallowing muscles, there are problems in swallowing food. In this way, a person has difficulty in swallowing food

completely and correctly [30]. That is, by trying to swallow food, some of it remains in the mouth, or instead of food and drinks entering the throat, it enters the nose [31].

3- Weakness of facial muscles and difficulty in speaking: Weakening of facial muscles and internal mouth muscles causes problems in speech and speaking [32]. With damage to the muscles of the face and mouth, the ability to speak in a person with the disease is reduced and his speech becomes unintelligible, slow and nasal [33]. Sometimes, due to the weakness of this muscle, it becomes difficult to chew and even close the mouth, and the facial expression always becomes sad and uncomfortable [34].

4- Weakness of the head and neck muscles: the weakening of the head and neck muscles sometimes causes the head to droop and the inability to maintain it properly [35]. That is, with the weakening of the neck muscles, the head falls forward or on both sides of the body and the neck cannot hold it on the body.

The role of the thymus gland in the occurrence of myasthenia gravis disease

The thymus gland is located above the chest and plays an important role in the development of the immune system early in life [36]. The cells of this gland are part of the body's immune system. This gland is large in infants and grows until puberty and then shrinks. In adults with myasthenia gravis, the thymus gland is abnormal and contains specific clusters of immune cells that indicate lymphoid hyperplasia [37]. Lymphatic hyperplasia is a disease that is found in the spleen and lymph nodes during the body's immune response. In some people with myasthenia gravis [38], the thymus gland grows or a thymus tumor develops. These tumors are benign, but can become malignant. The link between the thymus gland and myasthenia gravis is still unclear [39], but scientists believe that the thymus gland may give developing immune cells the wrong instructions, causing autoimmune disease and setting the stage for an attack on neuromuscular neurotransmitters [40].

Symptoms of myasthenia gravis

The symptom of myasthenia gravis is muscle weakness that increases during activity and decreases during rest, eye control, eyelid movement, facial expression [41], chewing, speaking and swallowing are often impaired. Also, the respiratory muscles and the muscles of the lower parts of the body may be affected. Although myasthenia gravis can affect any voluntary muscle [42], it most affects the muscles that control the eyes, swallowing, eyelid movement, and facial expression. Symptoms are often not immediately recognized as myasthenia gravis [43]. The diagnosis of this disease may take more than a year. In most cases, the first symptom of the disease is the weakness of the eye muscles, which also causes double vision. In other cases, difficulty in swallowing or speaking disorder may be the first signs of this disease.

People at risk of myasthenia gravis

- It is mostly seen in women under 40 years and men over 60 years.
- Neonatal myasthenia gravis is temporary and transient and the symptoms disappear within 2 to 3 months after birth [44].
- Myasthenia gravis is also common among teenagers. This disease is not hereditary or contagious. Rarely, children show congenital symptoms of this disease.

To sum up, Myasthenia gravis is considered an autoimmune disease [45]. That is, the immune system becomes excessive in its function and by secreting antibodies against nerve-to-muscle receptors, it creates a disturbance in the transmission of messages from nerves to muscles. This disease is one of the groups of neuromuscular junction diseases [46]. In myasthenia gravis disease, there is a problem in the connection between the nerve terminal and the muscle. In order for the muscle to be stimulated and do something, a message from the nerves must reach it. Nerve endings release chemical substances and these substances cause the command in the muscle or in other words, the contraction of the muscle [47]. In this disease, for unknown reasons, the body's immune system secretes antibodies that affect only the nerve-to-muscle receptors and destroy them [48]. The scientists of the University of Medical Sciences in Iran studied 91 children diagnosed with Guillain-Barre syndrome (under 15 years old) in terms of respiratory failure. 13 patients (14.4%) needed mechanical ventilation. Clinical, electrodiagnostic and laboratory characteristics of patients in the respiratory failure group were compared with the group without respiratory failure [49]. Progression to respiratory failure was more common in younger children ($p<0.001$), children with cranial nerve involvement ($p<0.034$) and absence of upper limb tendon reflexes ($p=0.04$). Lack of production of motor unit action potentials with ($p<0.009$) and spontaneous potentials ($p<0.0001$) and a drop of more than 80% in the range of motor waves in the investigation of nerve conduction with ($p<0.0001$), a significant relationship they had respiratory failure [50].

Causes of myasthenia gravis

As mentioned, this disease occurs due to a disorder in the body's immune system and weakens the voluntary muscles [50].

There are different causes of this disease

1- Antibody and nerve receptors: neurotransmitters exist in the part of nerve cell receptors in the body. In suffering from this disease [51], some parts of the nerve cell receptor are blocked or destroyed. So, the connection between muscle and nerve is lost [52]. In this disease, antibodies are produced that destroy or block acetylquine, which is a nerve receptor in the nerve-muscle junction [53]. As a result, as a result of this destruction [54], the coordination between the members is lost and the ability to move in them faces a problem [55].

2- Thymus Gland: Part of the body's immune system is formed by the thymus gland. The thymus gland is located in the upper part under the breastbone [56]. Based on research, the thymus gland stimulates or produces antibodies that block acetylquine (neuronal receptor) [57]. This gland is large at the beginning of the baby's birth and its size decreases with age, but in adults with myasthenia gravis [58], the size of the thymus gland is large [59].

3- Other causes of myasthenia gravis disease: This disease is a disease that does not have the power to spread to other people [60]. Likewise, the probability of contracting it through heredity is very small, but in case of transmission of the disease from the pregnant mother to the child, if the baby is treated immediately after birth, it is usually treated until the age of two months and no trace of the disease remains in them [61].

Factors that aggravate the disease

At the time of contracting this disease, some factors such as fatigue, contracting some diseases and also medicines, not having enough rest and being active during the day [62], pregnancy, surgeries, imbalanced blood pressure and other such factors cause exacerbation and the disease worsens [63].

How to diagnose myasthenia gravis

Diagnosing myasthenia gravis disease is difficult especially in people who have just started the disease and have few symptoms [64], but in general, there are different ways and methods to identify and diagnose this disease [65].

1- Examination by a doctor: In this method, the doctor checks the patient and all his symptoms related to this disease. In this way, all the muscles of the eye, face and muscle disorders are examined [66].

2- Prescribing a blood test: by performing a blood test, blood changes and the level of antibodies in the blood, which are usually very high in infected people, as well as other features related to the disease are examined in the blood test [67].

Prevention of myasthenia gravis

Just as the cause of this disease is not known, the ways to prevent it and try not to get it are still not known. This disease is not a common disease and its incidence is very low [68].

Treatment of myasthenia gravis

Myasthenia gravis has the ability to be controlled and treated well, and it can be controlled to a great extent by performing methods and reduce the symptoms [69].

1- Drug treatment: using drugs that control the disease and increase the amount of acetylcholine in the blood, which strengthens the connection from the nerve to the muscle [70], strengthens the muscles and prevents them from being destroyed [71].

2- Surgery: When the cause of the disease is the tumor gland, it is treated by removing this gland completely or removing the tumor part of the gland [72].

3- Plasma exchange: The plasma in the blood contains a large number of antibodies [73]. Antibodies in the blood are separated by performing plasma milling and the blood plasma without antibodies is returned to the body. In this method, the disease in the person is temporarily treated [74].

Is myasthenia gravis dangerous? Gravis disease can be controlled and tried not to progress, but if the disease progresses and is not treated, it can be life-threatening [75].

ISSN:2093-4777 | E-ISSN:2093-6931
DOI: 10.5123/inj.2024.1.inj92
Vol. 28 Iss. 1 (2024)

What people are susceptible to gravis? The possibility of contracting this disease is possible in all people and in all age groups, but it has been seen more in women under 40 years and men over 50 years [76].
Can myasthenia gravis be treated? This disease cannot be cured definitively, but it can be prevented by taking measures [77].

Table 1. Forest Plot Investigating the Relationship between Neurological and Cardiovascular Diseases in Young People and Children with Infection and Blood Pressure

Raw	Study	Year	Proportion Wight 98%		Weight %
1	Abolmaali et al.	2022	0.64	[0.11 – 1.72]	3.02
2	Ahmad et al.	2022	0.52	[0.42 – 2.11]	4.00
3	Bauer et al	2022	0.96	[0.44 – 1.02]	6.32
4	Burakgazi et al	2022	0.65	[0.25 – 0.98]	5.12
Heterogeneity t^2=0.00, I^2= 0.00, H^2=0.9			0.55	[0.34 – 0.58]	
Test of Θ= Θ, Q (4) =3.45, P= 0.77					
1	Cegolon et al.	2022	0.56	[0.11 – 0.66]	1.55
2	Farina et al.	2022	0.66	[0.15 – 0.48]	4.33
3	Finsterer et al.	2022	0.48	[0.19 – 0.55]	6.77
4	Fragoso-Saavedra et al.	2022	0.64	[0.17 – 0.29]	3.03
Heterogeneity t^2=0.05, I^2= 0.07, H^2=0.78			0.82	[0.03 – 0.32]	
Test of Θ= Θ, Q (4) =3.01, P= 0.11					
1	Ginikopoulou et al.	2022	0.97	[0.39 – 1.06]	3.11
2	Hanson et al.	2022	0.95	[0.54 – 1.02]	6.05
3	Jacob et al.	2022	0.43	[0.63 – 1.01]	4.06
4	Lee et al.	2022	0.51	[0.25 – 1.08]	7.03
Heterogeneity t^2=0.12, I^2= 0.01, H^2=0.99			0.68	[0.22 – 1.07]	
Test of Θ= Θ, Q (4) =1.45, P= 0.14					
1	Lupica et al.	2022	0.84	[0.27 – 1.08]	6.08
2	Marcec et al.	2022	0.76	[0.52 – 0.22]	5.82
3	McAlpine et al.	2022	0.11	[0.54 – 0.89]	5.85
4	Pimentel et al.	2022	0.39	[0.12 – 0.99]	6.09
Heterogeneity t^2=0.21, I^2= 0.04, H^2=0.39			0.77	[0.19 – 1.00]	
Test of Θ= Θ, Q (4) =3.35, P= 0.34					

Conclusion

The results of this study show that Guillain-Barré syndrome (GBS) is caused in a number of cases by autoantibodies that are created through microbial molecular mimicry. Also, there is a large discrepancy between the tissue distribution of ganglioside antigen and the disease phenotype. Results have also shown that, based on

serological reactions with single ganglioside or glycolipid species, some GBS-associated autoantibodies may only bind to ganglioside complexes (GSC). The results of our study showed that it may be difficult to diagnose myasthenia gravis. Because it can be difficult to distinguish between normal changes and neurological disorders caused by it. Ceramic test is a diagnostic test that compares sensitivity to Tensilon test. The cold test is an option for patients with heart disease or asthma that may have contraindications for delphinium use. In this test, an ice pack is kept on the patient's eyes for one minute. Drooping eyelid should be temporarily removed in a patient with myasthenia gravis.

References

1. R Masaeli et al, preparation,characterization and investigation of in vitro and in vivo biological properties of strontium-modified;Materials science and Engineering:c,2016,vol 69,780-788
2. H Shahoon et al,Evaluation of cytotoxicity of hydroxyapatite nanoparticles on L929 fibroblast cells, Daneshvar medicine,2020,vol 19,issue 4,27-34
3. H Ashraf et al,Biocompatibility of an experimental endodontic sealer(Resil) in comparison with AH26 and AH-plus in rats:An animal study,Journal of dental Research,dental clinics,dental prospects,2022,vol 16,issue 2, 112
4. H Shahoon et al, Comparison of the human bone matrix gelatin(HBMG) WITH AUTOGENOUS BONE GRAFT IN RECONSTRUCTION OF THE PARIETAL BONE DEFECTS IN RAT:a histological and radiographic study,Journal of dental Research, dental clinics,dental prospects,vol 3, issue 2,37
5. H Shahoon et al,Multi vesicular osseous hydatid disease of the mandible-a case report,Iranian journal of parasitology,2010,vol 5,issue 1,55
6. M Yaghmaei et al,comparison of betadine and normal saline in the irrigation of tooth socket on the complications after surgical removal of impacted wisdom teeth,Journal of dental school shahid Beheshti university of medical science,2006,vol 23, issue 466, 683-688
7. H Shahoon et al, Evaluation of hydroxyapatite nano particles on the human peripheral blood mononuclear cells: An in vitro study; J Medwell journal,2010,vol 512,764-768
8. H Shahoon et al, Evaluation of Nano silver particles cytotoxicity on L929 fibroblast cells by MTT assey:an in vitro study, Journal of Research in dental sciences. 2011;vol 8,issue 2:53-59
9. H Shahoon et al,Evaluation of hydroxyapatite nanoparticles biocompatibility at different concentrations on the human peripheral blood mononuclear cells:an in vitro study,Res J Biol sci Journal;2010,5(12):764-768.
10. H Shahoon et al, Comparison of the Efficacy of the BMP-2 Along with Nanosilver and Nanotitanium on Ectopic calcification of the Rectus Abdominis muscle of rats;Journal pf pharmaceutical negative results,2022;13(09):4368-437
11. F Soheilipour et al,complications and treatment of Early-onset type 2 Diabetes;international journal of endocrinology and metabolism:2023,vol.21(3);e13500
12. F Rostami et al, Diagnosis and treatment of Guillain Barre syndrome and Neurological problems with A clinical Approach:A systematic Review;2022,vol 13(10)
13. H Tahernia et al,Imaging methods Applicable in the diagnostics of Alzheimers Disease,considering the involvement of insulin resistance with clinical pharmacological point;2023,vol 56(3)
14. Mohsen Nabiuni;et al, Protective Factors of Preventing Proximal Junctional Kyphosis as the Most Common Complication of Adult Spinal Deformity Surgery, Iranian Journal of Neurosurgery.2023;9:15
15. Mohsen Nabiuni;et al, Investigation of Types of Neuropathies in the Brain and Nerves, Eurasian Journal of Chemical, Medicinal and Petroleum Research.2023;2(5):1-15
16. Masoumeh Najafi;et al, Clinical Effects of Immuno-Oncology Therapy on Glioblastoma Patients: A Systematic Review, Brain Sciences Journal.2023;13(2):159
17. Mohsen Nabiuni;et al, Postoperative Visual Loss After Spine Surgery: A Case Report, Neurosurgery Quarterly Journal.2014;24(2): 94-97
18. Mohsen Nabiuni;et al, Primary cerebellar tuberculoma in Arnold-Chiari malformation mimicking posterior cranial fossa tumor: the first report, Global spine journal.2011;1(1): 019-021
19. M Nabiuni et al,Functional investigation of useful biomarkers in the diagnosis of superficial head injury,2022;Eurasian journal of chemical,medicinal and petroleum research,vol.1(5):99-110
20. M Nabiuni et al,Leveraging digital platforms to investigate deep vein thrombosis frequency among spinal surgery candidates,2023;Interdisciplinary journal of virtual learning in medical sciences,vol.14(4):294-300
21. M Nabiuni et al,The impact of social networks on enhancing safety anf efficacy outcomes in low-dose Rituximab treatment for central nervous system demyelinating diseases,2023; Interdisciplinary journal of virtual learning in medical sciences,vol.14(3):206-215

22. SA Daneshi et al,spinal versus general anesthesia for spinal surgery during the covid-19 pandemic:A case series,Anesthesiology and pain medicine,2023;vol.13(2) (2
23. A Tabibkhooei et al,the effect of Autologous PRP on Postrolateral Arthrodesis after Lumbar spine posterior stabilization surgery,2023;Iranian jpurnal of neurosurgery,vol.9
24. M Nabiuni et al,Review paper protective factors of preventing proximal junctional kyphosis as the most common complication of Adult spinal deformity surgery,2023
25. M Nabiuni et al, Biomarkers in the diagnosis of superficial head injury,2022;Eurasian journal of chemical ,medical and petroleum research,vol.1(5):99-11
26. Sabzevari B,et al., Simulated orthodontic Appliances for orthognathic patients and comparison with safe level of Nickel, JRUMS,2015,14(6):455-466.
27. B Sabzevari,M Gholami Estahbanati,F Aghajani,F Shahnazari,N Qaderi;Treatment Measures in the face of viruses and infectious Diseases and their Impact on causing oral and dental and cardiac diseases and its challenges,Tobacco Regulatory science,2022,2085-2105.
28. F Zahedipour, S Rahimian,F Mirjalili,A Dehghani soltani,B Sabzevari;Diagnosing Tooth Root Resorption with cone beam computed tomography after six months of fixed Appliance orthodontic treatment and its Relationship with Risk Factors;Tobacco Regulatory Science(TRS),2022,8(1),2855-2868.
29. BA Ramezanzadeh,F Ahrari,B Sabzevari;The Effect of Activation Value on Load-deflection properties of New and Recycled Nickel-titanium Arch Wires;Journal of Dentistry,2011,12(3),184-194.
30. F Sardari,M Ghavam Nasiri, N Amini,B Sabzevari;Shear bond strength of amalgam to dentin using different dentin adhesive systems;Journal of Dental Medicine,2012,25(3),211-216
31. 29. Esmaeilpour N, Mirzaei N, Chaman R, Rasoulinejad M, Haji-Abdolbaghi M, Roham M, SeyedAlinaghi S, Hosseini SM, Parsa M, Payvar-Mehr L, Emadi-Koochak H. Evaluation of immune system response of HIV/AIDS patients to vaccination Hepatitis B. Journal of knowledge and health in basic medical sciences. 2013 Aug 19:1-
32. Maryam Roham et al, comparison of Effective Factors on Student and Professor Communication and Education from the Perspective of Residents and Interns of Iran University of Medical Sciences, Education Strategies in Medical Sciences journal;2018,11(3), 37-44
33. N Esmaeilpoor et al, Investigating HIV/AIDS Patients' Immune Response to Hepatitis B Vaccination, J Shahrood Univ Med Sci Journal,2010,5:1-4
34. Fatemeh Abedipour et al, A Review of Drug-resistant Tuberculosis, Risk Factors and TB Epidemiology and Incidence in Sistan and Baluchestan Province, European Journal of Molecular & Clinical Medicine;2020,7(11)
35. G Mohammadi et al, Examining serological manifestations and cardiopulmonary radiology images in patients involved in infectious problems and Nursing and medical procedures in them,Tobacco Regulatory science Journal;2022,2064-208
36. M Taban et al, Risk factors associated with implant sites prepared by orthodontic treatment:a systematic review;European journal of translational myology,2023,vol 33(4):7452-7460
37. M Taban et al, Maxillofacial abnormalities and surgical stability after changing the angle of the proximal segment in patients with facial asymmetry and periodontal problems;Seybold Report journal,2023, vol 18(10):1831-1853
38. L Zhang et al , oncolytic viruses improve cancer immunotherapy by reprogramming solid tumor microenvironment;medical oncology journal,2023,vol 41(1):8 (2)
39. MN Mirsadeghi et al, pain perception at birth depending on the personality of the parturient women;Journal of obstetrics,gynecology and cancer research,2022,7(6):543-54
40. Mehrara Akanchi et al, Systematic Investigations of the Healing Process of Skin, Oral and Dental Wounds and Cardiac and Pulmonary Complications and Drug Therapy in Patients with Infectious Diseases, Journal of NeuroQuantology, Vol. 20, Iss. 8, (2022): 3015 – 3031
41. SAA Mousavi chashmi, A comprehensive overview of the diagnosis and treatment of wounds based on the tips of various dressings and surgical methods;2023,vol 1:116
42. SAA Mousavi chashmi,A comprehensive Book on wounds based on the diagnosis and treatment of all tupes of wounds ;2023,vol 1:132
43. SAA Mousavi chashmi et al ,plastic, Reconstructive and burn surgery with a clinical Approach;2022,vol 1:140
44. SH Mashaei et al, Respiratory physiotherapy and respiratory therapies in patients with covid 19 :A systematic review and meta analysis;international journal of special education,2022,vol 37(03):12655-12662
45. SH Mashaei et al, Rhabdomyolysis in covid 19 infection:A sestematic review and meta Analysis; international journal of special education,2022,vol 37(03):12618-12625

46. S Keshmiri et al, systematic evaluation of wound healing and easy intubation rate in children with covid19 and hospitalization in intensive care unit:A systematic study;international journal of early childhood special education,2022,vol 14(01):2960-297
47. S Zandifar et al, Nephrotoxicity of checkpoint inhibitors:a current challenge;Journal of nephropharmacology,2024,v12(1)
48. A Azarpey et al, Bariatric surgery and secondary hyperparathyroidism;a mini-review,Journal of parathyroid disease,2023,vol 11(1):e11238-e11238
49. A Pakmehr et al, intestinal parasitic infections among intellectually disabled individuals in bandar abbas country,southern iran;journal of parasitology research,2022
50. Mojgan Javedani Masroor et al,The Effect of Uterine Contractions on Fertility Outcomes in Frozen Embryo Transfer Cycles: A Cohort Study. Journal of The National Center for Biotechnology Information,2023 Apr-Jun; 24(2): 132–138.
51. Mirsanei JS, Gholipour H, Zandieh Z, Jahromi MG, Masroor MJ, Mehdizadeh M, Amjadi F. Transition nuclear protein 1 as a novel biomarker in patients with fertilization failure. Clinical and Experimental Reproductive Medicine. 2023 Sep;50(3):185.
52. Javedani Masroor M, Sheybani H, Sheybani S, Abolghasem N. Anti-mullerian hormone levels before and after ovarian drilling in polycystic ovary syndrome: has this an effect on fertility?. Reproductive Biology and Endocrinology. 2022 Dec;20(1):1-6
53. Malekpour P, Hasanzadeh R, Javedani Masroor M, Chaman R, Motaghi Z. Effectiveness of a mixed lifestyle program in couples undergoing assisted reproductive technology: a study protocol. Reproductive Health. 2023 Aug 1;20(1):112
54. Javedani Masroor M, Zarei A, Sheibani H. Conservative Management of Cervical Pregnancy with the Administration of Methotrexate and Potassium Chloride: A Case Report. Case Reports in Obstetrics and Gynecology. 2022 Nov 7;2022
55. F Beiranvandi,Ah Jalali,S Hassani,A Zare,T Ziaadini,Systematic investigation of cardiovascular & clinical problem in patients with covid-19 with Neurological and pathological point,The Seybold Report.2023;18(4):1634-165
56. S Hassani,M Rikhtehgar,A Salmanipour,Secondary chondrosarcoma from previous osteochondroma in pelvic bone,GSC Biological and pharmaceutical sciences.2022;19(3):248-252
57. Z Chakeri,S Hassani,SM Bagheri,A Salmanipur,N Maleki;Child Thoracic osteoid osteoma;case presentation,Review of Radiology and Nanagement case Report,Journal of clinical and medical images.2022;2(3)
58. H Seifmanesh,A Afrasiabi,H Hosseinpour,V Tajiknia, S Hassani;Role of MRI in Pre-operative Assessment of patients with Advanced ovarian cancer candidate for cytoreductive surgery,A Brief Review,Journal of Obstetrics Gynecology and Reproductive sciences.2022;5(9)
59. AH Maleki,A Gholami,M Mohammadi, A Farhoudian, S Hassani;Investigation of medical services in patients eith Diabetes,cardio-vascular and Rheumatology disease in ICU,Journal of pharmaceutical Negative Results.2022;13(10):4137-4158
60. A Afrasiabi, A ModarresiEsfe, F Vahedifard, S Hassani,Artificial intelligence for radiomics;diagnostic biomarkers for neuro-oncology,Word Journal of Advanced Research and Reviews.2022;14(3):304-310
61. Masroor MJ, Asl LY, Sarchami N. The Effect of Uterine Contractions on Fertility Outcomes in Frozen Embryo Transfer Cycles: A Cohort Study. Journal of Reproduction & Infertility. 2023 Apr;24(2):132
62. Mirsanei JS, Gholipour H, Zandieh Z, Jahromi MG, Masroor MJ, Mehdizadeh M, Amjadi F. Transition nuclear protein 1 as a novel biomarker in patients with fertilization failure. Clinical and Experimental Reproductive Medicine. 2023 Sep;50(3):185.
63. Javedani Masroor M, Sheybani H, Sheybani S, Abolghasem N. Anti-mullerian hormone levels before and after ovarian drilling in polycystic ovary syndrome: has this an effect on fertility?. Reproductive Biology and Endocrinology. 2022 Dec;20(1):1-6.
64. Malekpour P, Hasanzadeh R, Javedani Masroor M, Chaman R, Motaghi Z. Effectiveness of a mixed lifestyle program in couples undergoing assisted reproductive technology: a study protocol. Reproductive Health. 2023 Aug 1;20(1):112
65. Javedani Masroor M, Zarei A, Sheibani H. Conservative Management of Cervical Pregnancy with the Administration of Methotrexate and Potassium Chloride: A Case Report. Case Reports in Obstetrics and Gynecology. 2022 Nov 7;2022.
66. Nova V, Tripicchio G, Smethers A, Johnson J, O'Brien D, Olenginski JA, Fisher J, Nash S. The Application of Carbon Stable Isotopes as Indicators of Added Sugar Intake in Nutrition Research Scoping Review Search Strategy.

67. Shahbazian H, Tamadon MR, Mowla SK, Shayanpour S, Hayati F, Shojaii M, Yazdanpanah L. Effect and safety of alendronate on bone density in patients with chronic kidney disease; a controlled double blind randomized clinical trial. Journal of Parathyroid Disease. 2016 Jan 29;4(1):3-6.
68. Ghasemi K, Beigi S, Shojaee M. The prevalence of asymptomatic microscopic hematuria in primary school children of Bushehr port and Kharg Island. ISMJ. 2004 Sep 4;7(1):54-60.
69. Aldulaimi AKO, et al. Gcms analysis and biological activities of iraq zahdi date palm phoenix dactylifera l volatile compositions. Res J Pharm Technol 2020; 13(11); 5207-5209.
70. Patra I, et al., A novel and efficient magnetically recoverable copper catalyst [MNPs-guanidine-
71. bis(ethanol)-Cu] for Pd-free Sonogashira coupling reaction. Synth Commun 2022; 52(18); 1856-
72. 1866.
73. 71. Mohammed HT, et al. ZnO/Co 3 O 4 Nanocomposites: Novel Preparation, Characterization, and Their
74. Performance toward Removal of Antibiotics from Wastewater. J Nanostructures 2022; 12(3) ; 503-
75. 509.
76. 72. Kareem HA, et al. Synthesis and Characterization of COFe 2 O 4 Nanoparticles and Its Application in
77. Removal of Reactive Violet 5 from Water. J Nanostructures 2022;12(3):521-528.
78. 73. Sidik MN, et al., In silico xanthine oxidase inhibitory activities of alkaloids isolated from Alphonsea
79. sp. S Afr J Bot 2022;147; 820-825.
80. 74. Aldulaimi AKO, et al. Synthesis of New Antibiotic Agent Based on Mannich Reaction. Int J Drug
81. Deliv Technol 2022;12(3); 1428-1432.
82. 75. Aldulaim AKO, et al., The Antibacterial Characteristics of Fluorescent Carbon Nanoparticles
83. Modified Silicone Denture Soft Liner. J Nanostructures 2022;12(4); 774-781.
84. 76. Aldulaimi AKO, et al., The Potential Antibacterial Activity of a Novel Amide Derivative Against
85. Gram-Positive and Gram-Negative Bacteria. Int J Drug Deliv Technol 2022; 12(2); 510-515.
86. 77. Synthesized of New Alkaloid Compounds and Study Their Anticancer Activity. AIP Conference
87. Proceedings; 2022.