



Doppler Ultrasound in the 34th Week of Pregnancy

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ABSTRACT

Doppler ultrasound is not used except for special cases of pregnancy such as twins in the first and second trimesters of pregnancy. According to medical advice, it is better to go for a Doppler sonography from the 28th week of pregnancy onwards, but doing a regular ultrasound during pregnancy is one of the necessities that dear mothers must do to take care of themselves and the fetus. Usually, a difference of a few days between the ultrasound age of the fetus and the normal age of the fetus is normal. The development status of the fetus and the discovery of the cause of the delay in its growth are performed on the pregnant mother. In fact, one of the reasons for requesting color Doppler ultrasound of the fetus during pregnancy is the low growth of the fetus. Doppler test, or Doppler sonography, is one of the types of ultrasound methods that are mainly used to detect blood clots in the body's vessels. By using Doppler ultrasound, problems such as blood clots, venous insufficiency, arterial blockage and carotid artery stenosis, heart valve violations or congenital cardiovascular diseases can be diagnosed.

Introduction

Uterine arteries are responsible for supplying blood to the uterus, and uterine artery Doppler ultrasound will check the adequacy of blood reaching the fetus in the uterus [1]. Due to the fact that the need for adequate growth of the fetus is access to enough oxygen and nutrients. Therefore, the walls of the uterine arteries must have sufficient elasticity to allow blood supply [2]. If enough blood is not provided to the fetus through the placenta, the fetus does not receive enough nutrients and oxygen, and there may be a possibility of pre-eclampsia, in which case it is necessary to do a Doppler ultrasound of the artery [3].

Doppler sonography of the umbilical artery: in this type of Doppler sonography, the blood flow from the mother's body to the placenta through the umbilical cord is examined. The reason for performing this type of Doppler sonography is to investigate the cause of the slow growth of the fetus or to investigate the sensitivity of the fetus to Rhesus

antibodies. Also, this Doppler sonography method is used in twin or multiple pregnancies in order to generally check the amount of nutrients received by the fetus for adequate growth [4].

Doppler ultrasound cardiography

Cardiotocography or echocardiography of the fetal heart is a form of Doppler ultrasound in which only sound is used to check the fetal heart rate. Of course, it is not necessary to do this type of Doppler ultrasound during pregnancy [5].

Cerebral artery Doppler sonography

Cerebral artery Doppler sonography checks the amount of blood supply to the fetal brain, which is performed in cases of fetal anemia and fetuses affected by rhesus antibodies [6].

Doppler sonography of the ductus venos: It is one of the uncommon types of Doppler sonography that is performed in the first three months of pregnancy along with other tests to find fetal chromosomal

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disorders (Figure 1) and also evaluate the umbilical vein that transfers blood to the fetal heart [7].

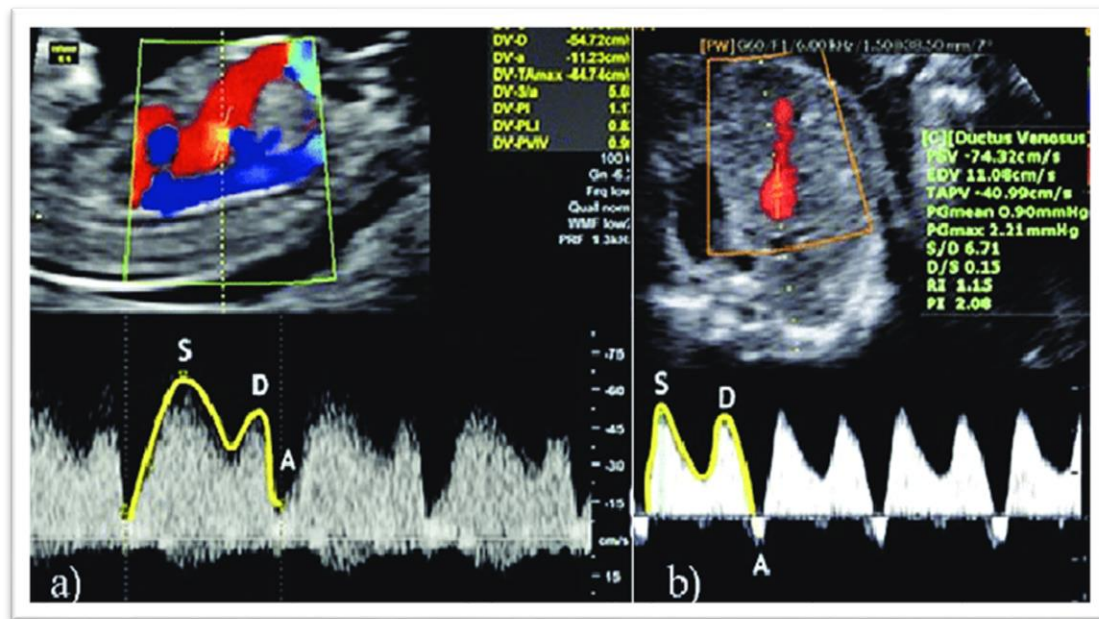


Figure 1. Doppler of the ductus venosus with normal triphasic flow

Doppler ultrasound for placental adhesion:

Doppler ultrasound can detect placental adhesion to the uterus with color Doppler ultrasound. In this way, numerous vascular spaces are observed inside the placenta and many vessels are observed between the placenta and the uterus. In addition, the normal space behind the placenta is lost, and finally, the insertion of the placental villi into the uterus, seeing the same numerous vascular spaces and bridging vessels in the thickness of the placenta, suggests the abnormal adhesion of the placenta to the uterus [8].

What is vaginal doppler ultrasound: Vaginal or intrauterine Doppler sonography is used to check for ectopic pregnancy in which the Doppler probe is placed inside the vagina [9].

What is color doppler ultrasound?

Color Doppler ultrasound is a revolution in the technology of using ultrasound methods, imaging the speed of movement and the amount of blood flow in the body's vessels. Standard ultrasound method of blood vessels is used to prepare color Doppler ultrasound images. That is, in this method, the computer converts Doppler sounds into color, and by doing so, the doctor can find out the speed and direction of the blood flow in the veins [10-12].

The reasons for using color Doppler sonography are:

- ✓ Detection of blocked blood vessels in body parts such as legs, arms and neck.
- ✓ Detection of blood clots in upper and lower limbs and legs.
- ✓ Assessment of blood flow function after stroke.

- ✓ Evaluation of varicose veins or other venous problems.
- ✓ Checking the amount and speed of blood flow to the kidneys.
- ✓ Finding the location and number of arterial plaques, if any.
- ✓ Examining the health of the fetus during pregnancy [13-15].

What is color doppler fetal ultrasound?

Color Doppler sonography of the fetus, which is a color imager of blood movement in the vessels using ultrasound waves, is used to diagnose the following:

- ✓ Examination of fetal blood flow.
- ✓ Checking the child's health status.
- ✓ Measuring the speed and reduction of blood flow in fetal umbilical cord blood flow.
- ✓ Detection of blood clots in fetal umbilical cord blood flow.
- ✓ Assessment of placental blood flow and blood flow in the heart and brain.
- ✓ Checking the adequacy of nutrients and oxygen reaching the placenta to the placenta and from the placenta to the fetus.

Types of Doppler ultrasound in non-pregnant situations

In addition to wide applications during pregnancy, Doppler sonography is also used to diagnose the health of the fetus and to diagnose various diseases. Among the most important types of Doppler sonography, we can mention Doppler sonography for examining kidney diseases and testicular Doppler sonography [16-18].

Kidney Doppler ultrasound

Renal doppler ultrasound or color renal vascular ultrasound is used to check the health status of renal vessels. Among the uses of kidney Doppler sonography, the following can be mentioned:

- ✓ Examination of stenosis or blockage of renal arteries.
- ✓ Diagnosing aneurysm or renal arterial dilatation.
- ✓ Diagnosis of kidney parenchymal diseases.
- ✓ Help to check the health of transplanted kidney or diagnosis of transplant rejection.
- ✓ Diagnosis of nutcracker syndrome.
- ✓ Examining the presence of masses, kidney stones or examining the small vessels inside the kidneys [19-21].

Preparation for Doppler ultrasound of renal vessels

Respected visitors to the radiology and ultrasound center should do all the preliminary procedures for Doppler sonography of the vessels. The list of actions that can be done before doing Doppler sonography of renal vessels is given in this section.

- ✓ Eat light soup the day before.
- ✓ 30 minutes after eating soup, eat a glass of castor oil.
- ✓ Pay attention, people over 80 kg should use 2 bottles of castor oil.
- ✓ Constipated people should use 2 bottles of castor oil.
- ✓ After using castor oil, take one Dimethicone tablet.
- ✓ There is no obstacle to taking the required medicines up to 24 hours [22].
- ✓ Fast for 6 to 8 hours before the ultrasound.
- ✓ Bring all relevant medical documents with you to hand over to the receptionist.

How to do kidney Doppler ultrasound

Doppler ultrasound of the kidney is performed exactly like a regular ultrasound of the kidney and is painless and without any complications. You just need to note that you need to fast for 6 hours to do the kidney Doppler ultrasound. It means that you have not eaten anything for 6 hours before the kidney ultrasound [23-25].

Color Doppler ultrasound of the testicles

Color Doppler ultrasound of the testicles or scrotum provides detailed images of the testicles, scrotum and blood vessels to the specialist. Among the reasons for doing a color Doppler ultrasound of the testicles are:

- ✓ Pain, swelling or lump near the scrotum.
- ✓ Diagnosis of varicocele, hydrocele problems.
- ✓ Undescended testicles
- ✓ Examination of blows to the testicles or twisting of the testicles.

Doppler ultrasound risks in pregnancy

Dear ladies, it is necessary to know that the Doppler ultrasound services at the radiology and ultrasound center are completely safe and without risk, and as long as this procedure is performed by trained and specialized people, it can even help the mother to ensure the health of herself and the fetus. get complete It should be noted that not doing an ultrasound throughout pregnancy can be dangerous. Performing Doppler ultrasound also reduces the risks of high-risk pregnancy, but vaginal Doppler ultrasound is not recommended in the first weeks of pregnancy [26].

Complications of Doppler ultrasound in pregnancy

There is no evidence of the dangers of Doppler ultrasound for the mother and the fetus. On the contrary, Doppler ultrasound can examine the function of the placenta, oxygenation and transfer of sufficient nutrients to the fetus, which is a very valuable method to evaluate the condition and health of the fetus.

Another reason why Doppler ultrasound is safe is that the ultrasound waves used in Doppler cardiography to listen to the fetal heartbeat are of low intensity and are safe as long as they are performed by trained and professional people. Is. It should be noted that 3D and 4D ultrasound, which is performed in specialized and subspecialized centers such as radiology and ultrasound centers, converts parts of 2D images into a 3D or 4D image, the intensity of which is the same as the intensity of a 2D scan. Is. In these centers, they automatically reduce the intensity of the ultrasound beam when using Doppler sonography [27-29].

However, four-dimensional ultrasound is not recommended in the first half of pregnancy. Because the fetus is very small and less active.

Bones of the soles of the feet

The sole of the foot is divided into three parts: back (ankle), middle (sole) and toes. The back part of the foot consists of 7 ankle bones. The talus is the highest bone of this set, which participates in the formation of the ankle joint with the tibia and fibula. The weight of the body is transferred from the tibia to the talus and from the talus to the calcaneus, which is located on the ground. There are three parts of the talus bone in the heel joint.

- The upper-middle part of the talus is jointed with the middle ankle and the upper part of this bone with the distal end of the tibia [30].
- The lateral part of the talus is articulated with the lateral ankle of the fibula.
- The lower part of the talus is jointed with the heel bone or calcaneus (the largest bone of the sole of the foot).

The cuboid bone forms a joint with the front end of the heel bone. There is a deep groove in the lower part of this bone for the passage of the muscle tendon. The talus bone articulates with the navicular or navicular bone in the front part. The boat bone forms a joint in the front part with three cuneiform bones (medial, medial and lateral). The upper part of these bones is wide and the lower part is narrow. The shape of these bones forms the curvature of the inner part of the foot. The lateral cuneiform and navicular bones form an articulation with the medial part of the cuboid bone. The sole of the foot is the end part of the lower limb that is placed on the ground [31]. The five long bones of the foot are located in front of the heel bones and behind the toe bones. We number these bones from the middle (inner) part of the foot. The first bone in the middle part is the shortest and the second bone is the longest. The proximal ends of these bones articulate with the cuboid or cuneiform bones.

The lateral part of the fifth metatarsal bone is connected to the skeletal muscles of this part. The distal end of each of these five bones articulates with one of the toe bones. This part of the bones of the sole of the foot is on the ground and forms the protrusion of the front part of the sole of the foot. Fingers are made up of 14 toe bones or "Phalanges" with an arrangement similar to finger bones. We number the fingers apart from the thumb (hallux) (1 to 5). The thumb consists of two proximal and distal bones, but each of the other four fingers consists of three proximal, middle, and distal bones. The interdigital joint is located between these bones.

Lower limb joints

Joints are parts of the human body skeleton that connect the ends of two bones together. The way the bones are placed in the joint determines the degree of movement of the organs. There are eleven joint groups between the bones of the lower limbs to help them move [32].

Side joint

The ball joint (spherical or ball-bowl) of the side is formed between the pelvic cavity (acetabulum) and the head of the femur bone. This joint has limited movement but high resistance to pressure and connects the legs to both sides of the pelvis. The surface of the femur and the pelvic cavity in the joint area is covered with cartilaginous tissue. Two types of intra-capsular ligaments (femoral head ligaments) and extra-capsular ligaments (ilium-femur ligaments, pubic bone-femur and ischial bone-femur ligaments) increase the resistance of this joint to physical damage. The side joint is a ball joint. Bending (with the help of hamstrings, rectus femoris, seam and shoulder muscles), opening (tibialis major, semimembranous, semitendinosus and biceps femoris), moving the leg away from the body axis (tibialis major, triceps minor, piriformis

and extensor muscle) Niam), bringing the leg closer to the body axis (with the help of the long, short and large, shoulder, and band adductor muscles), the external rotation of the thigh (with the help of the biceps femoris, serini major, piriformis with the help of the abductor muscles, gemelos or twin and quadriceps femur), the internal rotation of the thigh (with the help of the extensor muscles of niam and the front of the middle and small pelvis) is six movements of the leg in the lateral joint [33].

Knee joint

The synovial and hinge joint of the knee is formed between the distal end of the femur and the proximal end of the tibia. The main part of the movement of the bones in this joint is the opening and closing of the angle of the femur and tibia. But there is a small degree of rotation in the direction of the outer and inner parts of the foot in this joint. The knee joint consists of two femur-tibia and femur-patella joints, between the bones of which is hyaline cartilage. Opening the leg (with the help of the quadriceps tendon), bending the leg (with the help of the hamstring, band, suture and back of the knee muscles), external rotation (with the help of the biceps femora's muscle) and internal rotation (with the help of the semimembranosus', semitendino, band, sewing and back of the knee) are four movements of the leg in the knee joint. The knee joint consists of the femur-patella and femur-tibia joints [34].

The meniscus of the knee is a C-shaped cartilaginous tissue that is placed between the medial and lateral condyle of the tibia and fibula. This elastic tissue increases the resistance of the joint to physical blows. In addition to the meniscus, four sacks of joint fluid in the front and back of the knee joint prevent bone friction during movement and injury from physical blows. Ligaments are the third connective tissue in the place of eight body joints. There are three main ligaments in the knee joint.

- **Knee joint:** This tendon is located next to the quadriceps tendon and connects to the tibial prominence.
- **Parallel ligaments:** The tibial parallel ligament and the fibular parallel ligament are band ligaments on both sides of the knee joint, which play a role in facilitating the hinge movement of the knee. This ligament limits the inward and outward motion of the knee.
- **Tabular parallel ligament (internal):** It is a banded and wide connective tissue that connects the medial condyle of the femur to the medial condyle of the tibia in the middle part.
- **Fibular parallel ligament (external):** Dense, cord-like connective tissue narrower than the tibial ligament that connects the femoral epicondyle to the lateral surface of the fibular head [35-37].

- **Cruciate ligaments:** The back and front cruciate ligaments intersect in the path of connecting the femur to the tibia. That is why they are called crucifixes [38-40].
- **Anterior cruciate ligament:** This ligament in the front of the knee connects the inside of the tibial condyle to the cavity inside the femoral condyle and prevents the tibia from moving on the femur (dislocation of the knee) [41-43].
- **Dorsal cruciate ligament:** This ligament behind the knee connects the inner part of the tibial condyle to the cavity inside the femoral condyle and prevents the tibial bone from moving on the femur (dislocation of the knee) [44-46].

Conclusion

There are other types of Doppler sonography, which have different names according to their different uses. Among the terms of Doppler ultrasound are:

Doppler Doppler ultrasound: In Doppler Doppler ultrasound, sound waves produce a clear image of the scan taken from the examined area. In this way, a computer software converts the waves reflected from the vessels into a graph. This diagram helps the doctor to check and evaluate the speed of blood circulation and the direction of its flow.

Power Doppler ultrasound: Power Doppler ultrasound is similar to color Doppler ultrasound, but with the difference that it has the ability to penetrate into the organs to check the blood circulation inside the organs more precisely. The result of this ultrasound is a color image that shows the direction and speed of blood circulation.

Continuous wave Doppler ultrasound: This type of ultrasound, which is also called bedside Doppler ultrasound, is a method in which the specialist will hear the sound reflected from the continuous wave waves to find out the appropriateness of blood circulation or blockage and narrowing of the vessels. Bedside doppler sonography is used for immediate detection of blood vessel blockage in pregnant women and other patients.

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Authors' Contributions

All authors contributed to data analysis, drafting, and revising of the paper and agreed to be responsible for all the aspects of this work.

References

- [1] Z Chakeri, S Hassani, S bagheri, A Salmanipur, N Maleki, [Child Thoracic Osteoid Osteoma; Case Presentation, Review of Radiology and Management Case Report](#), Journal of Clinical and Medical Images, 2022, 2 (3)
- [2] Vadiati Saberi B, nejad shamsi P, Zamindar M ,Rahi D. Determination of frequency distribution of aggressive periodontitis in dental clinic of Rasht dental school in 2016-2017. Journal of Dentomaxillofacial Radiology, Pathology and Surgery.2021;10(1):34-39
- [3] Vadiati Saberi B, Afravi M, Rahi D. [The oral health status and oral hygiene practice of senior dental students: A cross-sectional study](#). Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2022; 11(1):1-6.
- [4] SR Ali, A Kouhi, S Hassani, M Shakiba, J Zebardast, H Ghanaati, [Vascular Blush Size Reduction, Technical Success and Safety of Intra-Arterial Embolization for Glomus Jugular Tumors: A Retrospective Cohort Study](#), IJ Radiology, 2012, 21 (1)
- [5] Seyed Morteza Bagheri, Sara Hassani and Alireza Salmanipour, [Aggressive Osteoblastoma in adolescents: Radiological case report](#), GSC Advanced Research and Reviews, 2022, 11 (3), 101-105
- [6] Seyed Amir Hossein Moussavi Jahanabadi, Seyed Masoud Sajedi, Neda Pouralimohamadi, Hamid Ghazipoor, Dorsa Rahi, [Examining the Principles of Oral and Dental Hygiene in Children and the Elderly with Burns and Facial Plastics Surgery: The Original Article](#): Tobacco Regulatory Science (TRS), 2022: 3198-3212
- [7] SAHM Jahanabadi, SM Sajedi, N Pouralimohamadi, H Ghazipoor, D Rahi, [Examining the Principles of Oral and Dental Hygiene in Children and the Elderly with Burns and Facial Plastics Surgery: The Original Article](#), Tobacco Regulatory Science (TRS), 2022, 3198-3212
- [8] Mohammad Reza Khami, Armin Gholamhossein Zadeh, Dorsa Rahi, [A cross-sectional study on COVID-19-related changes in self-medication with antibiotics](#): Journal of PloS one: 2022.17(6): e0269782
- [9] Mohammad Javad Rahimi, Fariba Mirakhori, Rebecca Zelmanovich, Christina Sedaros, Brandon Lucke-Wold, Gersham Rainone, Arshin Ghaedi, Shokoufeh Khanzadeh, [Diagnostic significance of neutrophil to lymphocyte ratio in recurrent aphthous](#)

[stomatitis: a systematic review and Meta-analysis: Dermatology Practical & Conceptual:2024;14\(1\): e2024046](#)

- [10] MKH Tahernia, M Ghasemian, F Rostami, S Hassani, M Khalilizad, [Imaging Methods Applicable in the Diagnostics of Alzheimers Disease, Considering the Involvement of Insulin Resistance with Clinical Pharmacological Point,](#) Pakistan Heart Journal, 2023, 56 (3)
- [11] MJ Rahimi, F Mirakhori, R Zelmanovich, C Sedaros, et al., [Diagnostic significance of neutrophil to lymphocyte ratio in recurrent aphthous stomatitis: a systematic review and Meta-analysis,](#) Dermatology Practical & Conceptual, 2024, 14 (1), e2024046
- [12] Maryam Milanifard, Soraya Mehrabi, Reza Ahadi, Mohsen Nabuini, Samaneh Azimi Souteh, Mohammad Taghi Joghataei, [Vitamin D receptor gene polymorphisms in patients with relapsing multiple sclerosis:](#) European Journal of Translational Myology, 2025
- [13] Maryam Milanifard, Soraya Mehrabi, Reza Ahadi, Mohsen Nabuini, Samaneh Azimi Souteh, Mohammad Taghi Joghataei, [Evaluation relationship between vitamin D Receptor and clinical and inflammatory factors in patients with relapsing-remitting multiple sclerosis:](#) European Journal of Translational Myology, 2024, 9;34(4):12939
- [14] Maryam Milanifard, Mahbobeh Ramezani. [Clinical and neurological problems and clinical tests in Alzheimer's patients specializing in Alzheimer's disease.](#) Eurasian Journal of Chemical, Medicinal and Petroleum Research.2025.4(1): 244-255
- [15] Manifar S, Tonkaboni A, Rahi S, Jafarnejad B, Gholamhosseinzade A, Kharazi-fard M. [The Prevalence of intubation induced dental complications among hospitalized patients.](#) Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2021; 10(1):20-26.
- [16] Manifar S, Tonkaboni A, Rahi D, Jafarnejad B, Gholamhosseinzade A, Kharazi-fard M. [The Prevalence of intubation induced dental complications among hospitalized patients.](#) Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2021; 10(1):20-26.
- [17] Majid Pouya, Saeid Pakseresht, Mostafa Dahmardehei, Aliakbar Jafarian, Fard Maryam Milani, Otaghvar Hamidreza Alizadeh, Farnaz Amini. [Medical and Pharmacological Evaluation of Scar Formation in Plastic Surgery.](#) Journal of

Medicinal and Chemical Sciences. 2022.5(4): 449-456

- [18] Majid Ahmadi Hamed Rahmani Youshanouei, Hamed Valizadeh, Amir Tahavvori, Fatemeh Yazdanfar, Mehdi Nadiri, Reza Mosaddeghi Heris, Ali Shariati, Farima Fakhri, Maryam Noori, Maryam Golmohammadi, Sara Kazeminia, Fariba Mirakhori, [Mesenchymal Stem cells as a bright therapeutic strategy for SLE: A Comprehensive Review:](#) NeuroQuantology: 2023;21(5): 334-364
- [19] Mahdi Rezaei, Amir Tahavvori, Nadia Doustar, Armin Jabraeilipour, Amirreza Khalaji, Ali Shariati, Reza Mosaddeghi Heris, Erfan Golshan Shali, Farima Fakhri, Fariba Mirakhori¹⁰, Hossein Tahernia¹¹, Hamed Rahmani Youshanlouei, [Mesenchymal Stem Cell Therapy For Alzheimer's Disease: A Review Of Msc-Derived Extracellular Vesicles In Clinical And Preclinical Models:](#) Journal of Pharmaceutical Negative Results, 2022, 13, 09
- [20] MA Hamed Rahmani Youshanouei, Hamed Valizadeh, et al., [Mesenchymal Stem cells as a bright therapeutic strategy for SLE: A Comprehensive Review,](#) NeuroQuantology, 2023, 21, 5, 334-364
- [21] M. Milani Fard, A.M. Milani Fard. [The Role of Complementary Medicine and Appropriate Treatment Methods in Improving the Symptoms of PMS.](#) Int. J. Adv. Stu. Hum. Soc. Sci. 2022, 11(1):64-71.
- [22] M Shojaei, [CHAT-GPT and artificial intelligence in Medical Endocrine System and interventions,](#) Eurasian Journal of Chemical, Medicinal and Petroleum Research, 2024, 3 (1), 197-209
- [23] M Shojaei, [Alternative Systematic Review of Insulin Resistance and the Role of Sex Steroids on Leptin Levels,](#) Eurasian Journal of Chemical, Medicinal and Petroleum Research, 2024, 3 (1), 296-306
- [24] M Pouya, S Pakseresht, M Dahmardehei, A Jafarian, FM Milani, et al., [Medical and Pharmacological Evaluation of Scar Formation in Plastic Surgery,](#) Journal of Medicinal and Chemical Sciences, 2022,5 (4), 449-456
- [25] M Milanifard, S Mehrabi, R Ahadi, M Nabuini, SA Souteh, MT Joghataei, [Evaluation relationship between VDR gene and clinical and inflammatory factors in patients with RRMS,](#) European Journal of Translational Myology, 2024, 34 (4)

- [26] M Milanifard, S Mehrabi, R Ahadi, M Nabini, SA Souteh, MT Joghataei, [Evaluation relationship between vitamin D Receptor and clinical and inflammatory factors in patients with relapsing-remitting multiple sclerosis](#), European Journal of Translational Myology, 2024, 34 (4), 12939
- [27] KH Mirzaei, M Shojaei, M Saboury, [Application of Robotic Instruments in Hip Arthroplasty Surgery Based on Practical Tips a Systematic Review](#), Eurasian Journal of Chemical, Medicinal and Petroleum Research, 2024, 3 (2), 593-609
- [28] Jafar Bolhari, Tina Amiri, Isa Karimi Keisomi, Masoome Mohseni Kabir, [Domestic violence prevention advocacy program: a pilot study in Tehran urban area](#), Iranian Journal of Psychiatry and Clinical Psychology; 2018;24(2)
- [29] A Jalali, S Hassani, S Albuzyad, A Moaddab, M Rajabzadeh, [Investigation of Cardiopulmonary Complications in Patients with Infection and Prevalence of Intubation in ICU with Radiological Point](#), Pakistan Heart Journal, 2023, 56 (2), 906-919
- [30] A Jalali, S Hassani, S Albuzyad, A Moaddab, M Rajabzadeh, [Investigation of Cardiopulmonary Complications in Patients with Infection and Prevalence of Intubation in ICU with Radiological Poin](#), Pakistan Heart Journal, 2023, 56 (2), 906-919
- [31] A Maleki, M Noorbakhsh, A Farhoudian, S Hassani, SA Karladani, [Functional Assessment of Challenging Behavior and Neurological & Cardio-Pulmonary Problem in Patients with Autism Syndrome: Diagnosis and Treatment](#), Journal of Pharmaceutical Negative Results, 2022, 13, 4112-4136
- [32] A Rafati, H Ghanaati, B Asadi, F Mehrabi, A Rahmatian, S Hassani, [Outcomes of the Fluoroscopically-Guided vs. Computed-Tomography-Guided Transforaminal Epidural Steroid Injection in Low Back Pain: A Propensity-matched Prospective Cohort](#), Medical journal of the Islamic Republic of Iran, 2025, 37, 23
- [33] AHM A Gholami, M Mohammadi, A Farhoudian, S Haassani, [Investigation of medical services in patients with Diabetes, cardio-vascular and Rheumatology disease in ICU](#), journal of pharmaceutical Negative Results, 2022, 13 (10), 4137
- [34] Ali Shariati, Amir Tahavvori, Nadia Doustar, Armin Jabraeilipour, Amirreza Khalaji, Reza Mosaddeghi Heris, Mahdi Rezaei, Erfan Golshan Shali, Farima Fakhri, Fariba Mirakhori, Hamed Rahmani Youshanlouei, [Advancements In Mesenchymal Stem Cell Therapy For Stroke: Promising Clinical Outcomes And Potential Role Of Extracellular Vesicles](#): Journal of Pharmaceutical Negative Results, 2022, 13, 08
- [35] Arshin Ghaedi & Shokoufeh Khanzadeh Sarvin Es Haghi, Monireh Khanzadeh, Shirin Sarejloo, Fariba Mirakhori, Jairo Hernandez, Emma Dioso, Michael Goutnik, Brandon Lucke-Wold: [Systematic review of the significance of neutrophil to lymphocyte ratio in anastomotic leak after gastrointestinal surgeries](#), BMC surgery, 2024(24)
- [36] B Vadiati Saberi, M Afravi, D Rahi, [The oral health status and oral hygiene practice of senior dental students: A cross-sectional study](#), Journal of Dentomaxillofacial Radiology, Pathology and Surgery, 2022, 11 (1), 1-6
- [37] B Vadiati Saberi, [nejad shamsi P, Zamindar M, Rahi D. Determination of frequency distribution of aggressive periodontitis in dental clinic of Rasht dental school in 2016-2017](#), Journal of Dentomaxillofacial Radiology, Pathology and Surgery, 2021, 10 (1), 34-39
- [38] Behnam Mahmoodiyeh, Houshang Taleby, Soheil Etemadi, Mohammad Saleh Sadri, Alireza Susanabadi, Maryam Milani Fard. [A Systematic Short Review in Evaluate the Complications and Outcomes of Acute Severe of Pediatric Anesthesia](#). Journal of Chemical Reviews 2021, 3(3): 219-231
- [39] D Rahi, N Tajbakhsh, S Abbassi, , [A systematic Review on Epidemiologic Study on Radiolucent lesions in Patients Referred to Radiology Departments](#), Eurasian Journal of Chemical, Medicinal and Petroleum Research. 2024; 3(3): 1016-1035.
- [40] D Rahi, N Tajbakhsh, S Abbassi, , [Evaluation of Root Canal Morphology of Mandibular Bone Using Radiological Imaged a Systematic Review](#), Eurasian Journal of Chemical, Medicinal and Petroleum Research. 2024; 3(3): 993-1015.
- [41] D Rahi, S Abbassi, N Tajbakhsh, [Evaluation of Root Canal Morphology of Mandibular Bone Using Radiological Imaged a Systematic Review](#), Eurasian Journal of Chemical, Medicinal and Petroleum Research, 2024, 3 (3), 993-1015
- [42] Dorsa Rahi, [Comparative Analysis of Root Resorption and Alveolar Remodeling in Maxillary Incisors During Orthodontic- Orthographic Surgical Treatment of Skeletal Class III Malocclusion](#), SPC Journal of Medical and Healthcare: 2025, 6(2): 1-10
- [43] Dorsa Rahi, [Factors in Glancing prophylactic Extraction of Mandibular Third molars in](#)

[orthodontic practice:A systematic study.](#) SPC
Journal of Medical and Healthcare:2025,1(2):85-
95.<https://doi.org/10.48309/sjmh.2025.513381.100>
9

[44] F Mirakhori, [Evaluation of Amyloid Plaques in the Nervous System of Alzheimer's Patients with Reference to Non-Pharmacological Treatments in Patients.](#) International Neurourology Journal, 2024, 28 (1), 804-820

[45] FA Mirghaed, TN Ahmadi, SS Albuzyad, AA Khorram, F Mahshad, [A Systematic Review of Molecular Expression and Genetic Mutations in Patients with Cystic Fibrosis and Alzheimer's Disease.](#) International Neurourology Journal, 2024, 28 (1), 773-786

[46] Jabbari Sendi MJ, Vadiati Saberi B, Rahi D. [Evaluation of microbial contamination of tooth brush and its related factors.](#) Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2022; 11(2):7-13.