

A REVIEW ON MIGRAINE

Devendra Borse*, Ganesh Patil and Akash Darbarsing Girase

India.

Article Received on: 04/03/2024

Article Revised on: 24/03/2024

Article Accepted on: 14/04/2024



*Corresponding Author

Devendra Borse

India.

ABSTRACT

Migraine is a debilitating condition that affects millions of people around the world. It is characterized by intense headaches, nausea, and sensitivity to light and sound. While there is no known cure for migraine, there are treatments available that can help reduce the severity and frequency of episodes. This article reviews the symptoms, causes, diagnosis, and treatment options for migraine. Symptoms include throbbing or pulsing pain on one side of the head, nausea or vomiting, sensitivity to light and sound, and vision disturbances such as seeing spots or flashing lights. The exact cause of migraine is unknown but it is believed to be related to changes in brain chemistry and/or genetics. Diagnosis of migraine is based on a physical exam and medical history. Treatment includes lifestyle changes such as avoiding triggers, getting regular exercise, eating a healthy diet, and getting enough sleep. Medications such as pain relievers, anti-nausea medications, triptans (drugs specifically designed for migraine), and botox injections may also be used to help reduce the severity of episodes.

KEYWORDS: Migraine, Pathogenesis, Treatment, Diagnosis.

INTRODUCTION

Migraine is a neurological disorder characterized by intense and recurring headaches, often accompanied by nausea, vomiting, and sensitivity to light and sound. The exact cause of migraine is not known, but it is believed to be related to changes in the brain's blood vessels or neurotransmitters.

Migraine attacks can last anywhere from a few hours to several days. During an attack, people may experience visual disturbances known as an aura. These can include seeing flashes of light or zigzag lines in their vision.

Common symptoms of migraine include throbbing or pulsating pain on one side of the head, nausea, vomiting, and sensitivity to light and sound. Other symptoms may include fatigue, dizziness, blurred vision, confusion, difficulty concentrating, and mood changes.

Treatment for migraine depends on the severity and frequency of attacks. Over-the-counter pain relievers such as ibuprofen or acetaminophen can help relieve milder symptoms. For more severe attacks, prescription medications such as triptans or ergotamine derivatives may be used. Other treatments such as biofeedback or relaxation techniques may also help reduce the frequency and severity of migraine attacks.

In some cases, lifestyle changes such as avoiding triggers like certain foods or stress can help reduce the frequency of migraines. Keeping a headache diary can also help identify potential triggers that should be avoided.

Migraine is a serious condition that can significantly impact quality of life. It is important to talk to your doctor if you are experiencing frequent or severe migraine attacks so that an appropriate treatment plan can be developed.

Symptoms

Migraine is a debilitating condition that affects millions of people around the world. It is characterized by intense headaches, nausea, and sensitivity to light and sound.

Symptoms of migraine include throbbing or pulsing pain on one side of the head, nausea or vomiting, sensitivity to light and sound, and vision disturbances such as seeing spots or flashing lights. These symptoms can last anywhere from four to 72 hours. Other common symptoms include fatigue, difficulty concentrating, mood changes, and increased thirst.

The exact cause of migraine is unknown but it is believed to be related to changes in brain chemistry and/or genetics. It is also thought that environmental factors such as stress, certain foods, and changes in sleep patterns can trigger an episode.

Diagnosis of migraine is based on a physical exam and medical history. Your doctor may also order tests such as an MRI or CT scan to rule out other conditions that may be causing your symptoms.

In conclusion, migraine is a debilitating condition that affects millions of people around the world. While there

is no known cure for migraine, there are treatments available that can help reduce the severity and frequency of episodes. If you think you may have migraine, talk to your doctor about your symptoms and treatment options.

Pathogenesis

The exact cause of migraine is not known, but it is believed to be related to changes in the brain's blood vessels or neurotransmitters. These changes can cause a variety of symptoms, including throbbing pain, nausea, vomiting, and sensitivity to light and sound.

It is thought that migraine may be triggered by certain factors such as stress, certain foods, hormonal changes, and environmental factors. These triggers can cause the brain to release chemicals that lead to the constriction and dilation of blood vessels in the brain. This can cause inflammation and pain in the head.

Diagnosis

Migraine is typically diagnosed based on the patient's medical history and a physical examination. A doctor may ask questions about the frequency and severity of headaches, as well as any other symptoms that may be present. The doctor may also order tests such as an MRI or CT scan to rule out other possible causes of the headaches.

In some cases, a doctor may diagnose migraine based on the presence of certain symptoms. For example, if a patient experiences an aura before a headache, this can be an indication of migraine. Additionally, if a patient has experienced at least five episodes of headache lasting between four and 72 hours, this can also be an indication of migraine.

Treatment for migraine is typically tailored to the individual and can include medications, lifestyle changes, and relaxation techniques. It is important to talk to your doctor if you are experiencing frequent or severe migraine attacks so that an appropriate treatment plan can be developed.

Treatment

Treatment for migraine depends on the severity and frequency of attacks. Over-the-counter pain relievers such as ibuprofen or acetaminophen can help relieve milder symptoms. For more severe attacks, prescription medications such as triptans or ergotamine derivatives may be used. Other treatments such as biofeedback or relaxation techniques may also help reduce the frequency and severity of migraine attacks.

In some cases, lifestyle changes such as avoiding triggers like certain foods or stress can help reduce the frequency of migraines. Keeping a headache diary can also help identify potential triggers that should be avoided.

It is important to talk to your doctor if you are experiencing frequent or severe migraine attacks so that

an appropriate treatment plan can be developed.

CONCLUSION

Treatment for migraine depends on the severity and frequency of attacks. Over-the-counter pain relievers such as ibuprofen or acetaminophen can help relieve milder symptoms. For more severe attacks, prescription medications such as triptans or ergotamine derivatives may be used. Other treatments such as biofeedback or relaxation techniques may also help reduce the frequency and severity of migraine attacks.

In some cases, lifestyle changes such as avoiding triggers like certain foods or stress can help reduce the frequency of migraines. Keeping a headache diary can also help identify potential triggers that should be avoided.

It is important to talk to your doctor if you are experiencing frequent or severe migraine attacks so that an appropriate treatment plan can be developed.

REFERENCES

1. Afridi, S.K., Kaube, H., Goadsby, P.J., Glyceryl trinitrate triggers premonitory symptoms in migraineurs. *Pain*, 2004; 110(3): 675–680.
2. Afridi, S.K., Giffin, N.J., Kaube, H., Friston, K.J., Ward, N.S., Frackowiak, R.S., et al., A positron emission tomographic study in spontaneous migraine. *Arch. Neurol*, 2005; 62(8): 1270–1275.
3. Afridi, S.K., Matharu, M.S., Lee, L., Kaube, H., Friston, K.J., Frackowiak, R.S., et al. A PET study exploring the laterality of brainstem activation in migraine using glyceryl trinitrate. *Brain*, 2005; 128(Pt 4): 932–939.
4. Akerman, S., Goadsby, P.J., Neuronal PAC1 receptors mediate delayed activation and sensitization of trigeminocervical neurons: relevance to migraine. *Sci. Transl. Med.*, 2015; 7(308): 308ra157.
5. Akerman, S., Kaube, H., Goadsby, P.J., Anandamide is able to inhibit trigeminal neurons using an in vivo model of trigeminovascular-mediated nociception. *J. Pharmacol. Exp. Ther*, 2004; 309: 56–63.
6. Akerman, S., Karsan, N., Bose, P., Hoffmann, J.R., Holland, P.R., Romero-Reyes, M., et al., Nitroglycerine triggers triptan-responsive cranial allodynia and trigeminal neuronal hypersensitivity. *Brain*, 2019; 142(1): 103–119.
7. Akerman, S., Romero-Reyes, M., Preclinical studies investigating the neural mechanisms involved in the co-morbidity of migraine and temporomandibular disorders: the role of CGRP. *Br. J. Pharmacol*, 2020; 177(24): 5555–5568.
8. Akerman, S., Williamson, D.J., Kaube, H., Goadsby, P.J., Nitric oxide synthase inhibitors can antagonize neurogenic and calcitonin gene-related peptide induced dilation of dural meningeal vessels. *Br. J. Pharmacol*, 2002; 137(1): 62–68.
9. Akerman, S., Romero-Reyes, M., Karsan, N., Bose, P., Hoffmann, J.R., Holland, P.R., et al., Therapeutic

- targeting of nitroglycerin-mediated trigeminovascular neuronal hypersensitivity predicts clinical outcomes of migraine abortives. *Pain*, 2021; 162(5): 1567–1577.
10. Akerman, S., Salvemini, D., Romero-Reyes, M., Targeting reactive nitroxidative species in preclinical models of migraine. *Cephalalgia*, 2021; 41(11–12): 1187–1200. Alderton, W.K., Angell, A.D., Craig, C., Dawson, J., Garvey, E., Moncada, S., et al., 2005. GW274150 and GW273629 are potent and highly selective inhibitors of inducible nitric oxide synthase in vitro and in vivo. *Br. J. Pharmacol*, 145(3): 301–312. Alpuente, A., Gallardo, V.J., Asskour, L., Caronna, E., Torres-Ferrus, M., Pozo-Rosich, P., Salivary CGRP can monitor the different migraine phases: CGRP (in) dependent attacks. *Cephalalgia*, 2022; 42(3): 186–196.
 11. Amin, F.M., Hougaard, A., Schytz, H.W., Asghar, M.S., Lundholm, E., Parvaiz, A.I., et al., Investigation of the pathophysiological mechanisms of migraine attacks induced by pituitary adenylate cyclase-activating polypeptide-38. *Brain*, 2014; 137(Pt 3): 779–794.
 12. Anderson, E.M., Mills, R., Nolan, T.A., Jenkins, A.C., Mustafa, G., Lloyd, C., et al., Use of the Operant Orofacial Pain Assessment Device (OPAD) to measure changes in nociceptive behavior. *J. Vis. Exp.*, 2013; 76: e50336.
 13. Ashina, M., Hansen, J.M., Olesen, J., Human models of migraine - short-term pain for long-term gain. *Nat. Rev. Neurol*, 2017; 13(12): 713–724.
 14. Ashina, M., Hansen, J.M., Olesen, J., Pearls and pitfalls in human pharmacological models of migraine: 30 years' experience. *Cephalalgia*, 2013; 33(8): 540–553.
 15. Askari-Zahabi, K., Abbasnejad, M., Kooshki, R., Raouf, M., Esmaeili-Mahani, S., Pourrahimi, A.M., et al., The role of basolateral amygdala orexin 1 receptors on the modulation of pain and psychosocial deficits in nitroglycerin-induced migraine model in adult male rats. *Korean J. Pain*, 2022; 35(1): 22–32.
 16. Avona, A., Mason, B.N., Lackovic, J., Wajahat, N., Motina, M., Quigley, L., et al., Repetitive stress in mice causes migraine-like behaviors and calcitonin gene-related peptide-dependent hyperalgesic priming to a migraine trigger. *Pain*, 2020; 161(11): 2539–2550.
 17. Bahra, A., Matharu, M.S., Buchel, C., Frackowiak, R.S., Goadsby, P.J., Brainstem activation specific to migraine headache. *Lancet*, 357(9261): 1016–1017. Barbanti, P., Egeo, G., Aurilia, C., Fofi, L., Della-Morte, D., 2014. Drugs targeting nitric oxide synthase for migraine treatment. *Expert Opin. Investig. Drugs*, 2001; 23(8): 1141–1148.
 18. Bates, E.A., Nikai, T., Brennan, K.C., Fu, Y.H., Charles, A.C., Basbaum, A.I., et al., Sumatriptan alleviates nitroglycerin-induced mechanical and thermal allodynia in mice. *Cephalalgia*, 2009; 30(2): 170–178.
 19. Beckman, J.S., Beckman, T.W., Chen, J., Marshall, P.A., Freeman, B.A., Apparent hydroxyl radical production by peroxynitrite: implications for endothelial injury from nitric oxide and superoxide. *Proc. Natl. Acad. Sci. USA*, 87(4): 1620–1624. Benjamin, L., Levy, M.J., Lasalandra, M.P., Knight, Y.E., Akerman, S., Classey, J.D., et al., 2004. Hypothalamic activation after stimulation of the superior sagittal sinus in the cat: a Fos study. *Neurobiol. Dis.*, 1990; 16(3): 500–505.
 20. Bertels, Z., Singh, H., Dripps, I., Siegersma, K., Tipton, A.F., Witkowski, W.D., et al., Neuronal complexity is attenuated in preclinical models of migraine and restored by HDAC6 inhibition. *Elife*, 2021; 10.
 21. Bhatt, D.K., Gupta, S., Jansen-Olesen, I., Andrews, J.S., Olesen, J., NXN-188, a selective nNOS inhibitor and a 5-HT_{1B/1D} receptor agonist, inhibits CGRP release in preclinical migraine models. *Cephalalgia*, 2013; 33(2): 87–100.
 22. Boes, T., Levy, D., Influence of sex, estrous cycle, and estrogen on intracranial dural mast cells. *Cephalalgia*, 2012; 32(12): 924–931.
 23. Boni, L.J., Ploug, K.B., Olesen, J., Jansen-Olesen, I., Gupta, S., The in vivo effect of VIP, PACAP-38 and PACAP-27 and mRNA expression of their receptors in rat middle meningeal artery. *Cephalalgia*, 2009; 29(8): 837–847.
 24. Bonini, M.G., Stadler, K., Silva, S.O., Corbett, J., Dore, M., Petranka, J., et al., Constitutive nitric oxide synthase activation is a significant route for nitroglycerin-mediated vasodilation. *Proc. Natl. Acad. Sci. USA*, 2008; 105(25): 8569–8574.
 25. Brennan, K.C., Bates, E.A., Shapiro, R.E., Zyuzin, J., Hallows, W.C., Huang, Y., et al., Casein kinase idelta mutations in familial migraine and advanced sleep phase. *Sci Transl Med*, 2013; 5(183): 183ra56, 1–11.
 26. Burgos-Vega, C.C., Quigley, L.D., Trevisan Dos Santos, G., Yan, F., Asiedu, M., Jacobs, B., et al., Non-invasive dural stimulation in mice: A novel preclinical model of migraine. *Cephalalgia*, 2019; 39(1): 123–134.
 27. Burstein, R., Yamamura, H., Malick, A., Strassman, A.M. Chemical stimulation of the intracranial dura induces enhanced responses to facial stimulation in brain stem trigeminal neurons. *J. Neurophysiol*, 1998; 79(2): 964–982.
 28. Burstein, R., Yarnitsky, D., Goor-Aryeh, I., Ransil, B.J., Bajwa, Z.H. An association between migraine and cutaneous allodynia. *Ann. Neurol*, 2000; 47(5): 614–624.
 29. Burstein, R., Jakubowski, M., Garcia-Nicas, E., Kainz, V., Bajwa, Z., Hargreaves, R., et al., Thalamic sensitization transforms localized pain into widespread allodynia. *Ann. Neurol*, 2010; 68(1): 81–91.
 30. Burstein, R., Nosedá, R., Borsook, D. Migraine: multiple processes, complex pathophysiology. *J.*

- Neurosci, 2015; 35(17): 6619–6629.
31. Casili, G., Lanza, M., Filippone, A., Campolo, M., Paterniti, I., Cuzzocrea, S., et al., 2020.
 32. Dimethyl fumarate alleviates the nitroglycerin (NTG)-induced migraine in mice. *J. Neuroinflammation*, 17(1): 59.
 33. Caudle, R.M., Caudle, S.L., Flenor, N.D., Rohrs, E.L., Neubert, J.K., Pharmacological characterization of orofacial nociception in female rats following nitroglycerin administration. *Front. Pharmacol*, 2020; 11: 527495.
 34. Charles, A., Flippen, C., Romero Reyes, M., Brennan, K.C., Memantine for prevention of migraine: a retrospective study of 60 cases. *J. Headache Pain*, 2007; 8(4): 248–250.