

Pharmacotherapeutic Considerations in the Treatment of Neuropathic Pain

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LEARNING OBJECTIVES:

Upon completion of this educational program, the participant should be able to:

Peripheral Neuropathy:

1. List the various drug classes used to treat peripheral neuropathy.
2. Understand the pathophysiology of peripheral neuropathy.
3. List the various toxicities associated with the different drug therapies used in peripheral neuropathy.
4. List advantages and disadvantages of the drug classes discussed, including anti-depressants, anti-convulsants, anti-arrhythmics, opioids.
5. Understand the importance of drug-drug interactions when prescribing or dispensing medications used in the treatment of neuropathy.

REFERENCES: NEUROPATHY

1. Argov, Z. and F.L. Mastaglia, *Drug-induced peripheral neuropathies*. Br Med J, 1979. **1**(6164): p. 663-6.
2. Backonja, M., et al., *Gabapentin for the symptomatic treatment of painful neuropathy in patients with diabetes mellitus: a randomized controlled trial [see comments]*. Jama, 1998. **280**(21): p. 1831-6.
3. Carrazana, E.J. and S.C. Schachter, *Alternative uses of lamotrigine and gabapentin in the treatment of trigeminal neuralgia [letter; comment]*. Neurology, 1998. **50**(4): p. 1192.
4. Cesena, R.M. and N.A. Calcutt, *Gabapentin prevents hyperalgesia during the formalin test in diabetic rats*. Neurosci Lett, 1999. **262**(2): p. 101-4.
5. Chapman, V., et al., *Effects of systemic carbamazepine and gabapentin on spinal neuronal responses in spinal nerve ligated rats*. Pain, 1998. **75**(2-3): p. 261-72.
6. Childers, M.K. and D. Holland, *Psychomotor agitation following gabapentin use in brain injury*. Brain Inj, 1997. **11**(7): p. 537-40.
7. Craven, R.S., *Furadantin neuropathy*. Aust N Z J Med, 1971. **1**(3): p. 246-9.
8. Dallochio, C., Buffa, C, Mazzarello, P., Chirolì, S. Gabapentin vs. amitriptyline in painful diabetic neuropathy. an open-label pilot study. J Pain Symptom Manage., 2000, Oct;20(4):280-5.
9. Daun, H., *[Polyneuropathies as a diagnostic and therapeutic task]*. Fortschr Med, 1977. **95**(14): p. 935-43.
10. Davey, R., *Macrodantin: a cautionary tale*. Med J Aust, 1986. **145**(9): p. 476-7.
11. Donnadieu, S. and M.C. Djian, *[Pain therapy]*. Presse Med, 1998. **27**(39): p. 2062-9.
12. Durand JP, Alexandre J, Guillevin L, Goldwasser F. Clinical activity of venlafaxine and topiramate against oxaliplatin-induced disabling permanent neuropathy. Anticancer Drugs. 2005 Jun;16(5):587-91.
13. Evidente, V.G. and C.H. Adler, *How to help patients with restless legs syndrome. Discerning the indescribable and relaxing the restless*. Postgrad Med, 1999. **105**(3): p. 59-61, 65-6, 73-4.
14. Fudin, J., Allen, J. *Nitrofurantoin-induced neuropathy and muscle weakness: a case report with chronic use*. The Consultant Pharmacist, January 2000. **15**(1):p77-82.
15. Fudin, J., Audette, C. *Gabapentin vs amitriptyline for the treatment of peripheral neuropathy. [Letter]*. Arch Intern Med., April 10, 2000. **160**: p140.
16. Fullerton, P.M., *Toxic chemicals and peripheral neuropathy: clinical and epidemiological features*. Proc R Soc Med, 1969. **62**(2): p. 201-4.
17. Gallagher RM. Primary care and pain medicine. Med Clin N Am. 1999;83(3):555-583.
18. Gorson, K.C., et al., *Gabapentin in the treatment of painful diabetic neuropathy: a placebo controlled, double blind, crossover trial [letter]*. J Neurol Neurosurg Psychiatry, 1999. **66**(2): p. 251-2.
19. Goldstein DJ, Lu Y, Detke MJ, Lee TC, Iyengar S. Duloxetine vs. placebo in patients with painful diabetic neuropathy. Pain. 2005 May 28.
20. Grothe DR, Scheckner B, Albano D. Treatment of pain syndromes with venlafaxine. Pharmacotherapy. 2004 May;24(5):621-9. Review.
21. Grothe DR, Scheckner B, Albano D. Treatment of Pain Syndromes with Venlafaxine. Pharmacotherapy 2004;24(5):621-629.
22. Grushka, M., M. Tchechik, and S. Weiss, *[Peripheral neuropathy due to prolonged treatment with nitrofurantoin]*. Harefuah, 1975. **88**(1): p. 23-6.
23. Haslbeck M. [New options in the treatment of various forms of diabetic neuropathy] MMW Fortschr Med. 2004 May 20;146(21):47-50. German.

24. Holmberg, L., *et al.*, *Adverse reactions to nitrofurantoin. Analysis of 921 reports.* Am J Med, 1980. **69**(5): p. 733-8.
25. Honet, J.C., *Electrodiagnostic study of a patient with peripheral neuropathy after nitrofurantoin therapy.* Arch Phys Med Rehabil, 1967. **48**(4): p. 209-12.
26. Jacknowitz, A.I., J.L. Le Frock, and R.A. Prince, *Nitrofurantoin polyneuropathy: report of two cases.* Am J Hosp Pharm, 1977. **34**(7): p. 759-62.
27. Jacknowitz, A., *Nitrofurantoin and peripheral neuropathy [letter].* Ann Intern Med, 1985. **102**(1): p. 138-9.
28. Khan, O.A., *Gabapentin relieves trigeminal neuralgia in multiple sclerosis patients.* Neurology, 1998. **51**(2): p. 611-4.
29. Kursbaum, A. and E. Rottenstreich, *[Acute hepatitis and pneumonitis associated with nitrofurantoin].* Harefuah, 1990. **119**(12): p. 427-8.
30. Lithner F. Venlafaxine in treatment of severe painful peripheral diabetic neuropathy. Diabetes Care. 2000 Nov;23(11):1710-1.
31. Low, P.A. and R.M. Dotson, *Symptomatic treatment of painful neuropathy [editorial; comment].* Jama, 1998. **280**(21): p. 1863-4.
32. Lucier, E. and L. Franm, *Use of gabapentin in a case of facial neuritis [letter].* Anesth Analg, 1997. **85**(6): p. 1410.
33. Mackin, G.A., *Medical and pharmacologic management of upper extremity neuropathic pain syndromes.* J Hand Ther, 1997. **10**(2): p. 96-109.
34. Margolis, K., *Gabapentin for painful diabetic neuropathy [letter].* Jama, 1999. **282**(2): p. 133; discussion 134.
35. Max MB, Lynch SA, et al. Effects of desipramine, amitriptyline, and fluoxetine on pain in diabetic neuropathy. The New England Journal of Medicine. 1992;326:19:1250-1256.
36. McLeod, J.C., *Peripheral neuropathy caused by drugs and toxic substances.* Aust N Z J Med, 1971. **1**(3): p. 268-9.
37. Merren, M.D., *Gabapentin for treatment of pain and tremor: a large case series.* South Med J, 1998. **91**(8): p. 739-44.
38. Morris, J.S., *Nitrofurantoin and peripheral neuropathy with megaloblastic anaemia.* J Neurol Neurosurg Psychiatry, 1966. **29**(3): p. 224-8.
39. Newshan, G., *HIV neuropathy treated with gabapentin [letter].* Aids, 1998. **12**(2): p. 219-21.
- . Pages, M. and A.M. Pages, *[Neuropathy during prolonged treatment with nitrofurantoin. Study of a nerve biopsy].* Arch Anat Cytol Pathol, 1988. **36**(4): p. 167-9.
40. Penn, R.G. and J.P. Griffin, *Adverse reactions to nitrofurantoin in the United Kingdom, Sweden, and Holland.* Br Med J (Clin Res Ed), 1982. **284**(6327): p. 1440-2.
41. Rosenberg, J.M., *et al.*, *The effect of gabapentin on neuropathic pain.* Clin J Pain, 1997. **13**(3): p. 251-5.
42. Rosner, H., L. Rubin, and A. Kestenbaum, *Gabapentin adjunctive therapy in neuropathic pain states.* Clin J Pain, 1996. **12**(1): p. 56-8.
43. Rowland, L.P., *Controversies about amyotrophic lateral sclerosis.* Neurologia, 1996. **11 Suppl 5**: p. 72-4.
44. Rowbotham M, Harden N, Stacey B, Bernstein P, Magnus-Miller L. Gabapentin for the treatment of postherpetic neuralgia a randomized controlled trial. JAMA. 1998;280:1837-1842.
45. Rowbotham MC, Goli V, Kunz NR, Lei D. Venlafaxine extended release in the treatment of painful diabetic neuropathy: a double-blind, placebo-controlled study. Pain. 2004 Aug;110(3):697-706. Erratum in: Pain. 2005 Jan;113(1-2):248.
46. Schiebel, N.E. and J. Ebbert, *Gabapentin for painful diabetic neuropathy [letter].* Jama, 1999. **282**(2): p. 133; discussion 134.

47. Segal, A.Z. and G. Rordorf, *Gabapentin as a novel treatment for postherpetic neuralgia*. Neurology, 1996. **46**(4): p. 1175-6.
48. Seidl, J.J. and J.G. Slawson, *Gabapentin for painful diabetic neuropathy*. J Fam Pract, 1999. **48**(3): p. 173-4.
49. Semenchuk M, Adjuvant analgesic for management of neuropathic pain. Pharmacy Newswatch. Biezer JL ed. Park-Davis. 1999;(6) no 1.
50. Silva, J.M., L. McGirr, and P.J. O'Brien, *Prevention of nitrofurantoin-induced cytotoxicity in isolated hepatocytes by fructose*. Arch Biochem Biophys, 1991. **289**(2): p. 313-8.
51. Sist, T., et al., *Gabapentin for idiopathic trigeminal neuralgia: report of two cases*. Neurology, 1997. **48**(5): p. 1467.
52. Solaro, C., et al., *An open-label trial of gabapentin treatment of paroxysmal symptoms in multiple sclerosis patients*. Neurology, 1998. **51**(2): p. 609-11.
53. Thomas, P.K., *Peripheral neuropathy*. Br Med J, 1970. **1**(692): p. 349-52.
54. Tremont L, Megeff IW, Backonja MM. Anticonvulsants for neuropathic pain syndromes: mechanisms of action and place in therapy. Drugs. 2000 Nov; 60(5): 1029-52.
55. Uldry, P.A. and F. Regli, *[Peripheral neuropathies caused by drugs]*. Schweiz Rundsch Med Prax, 1989. **78**(23): p. 667-70.
56. Wetzel, C.H. and J.F. Connelly, *Use of gabapentin in pain management*. Ann Pharmacother, 1997. **31**(9): p. 1082-3.
57. White, W.T., L. Harrison, and J.d. Dumas, *Nitrofurantoin unmasking peripheral neuropathy in a type 2 diabetic patient*. Arch Intern Med, 1984. **144**(4): p. 821.
58. Yiannikas, C., J.D. Pollard, and J.G. McLeod, *Nitrofurantoin neuropathy*. Aust N Z J Med, 1981. **11**(4): p. 400-5.
59. Yilmaz ME, Kadiroglu AK, Kara IH, Dikici S. Venlafaxine in the treatment of painful peripheral diabetic neuropathy in a uremic patient undergoing hemodialysis. MedGenMed. 2002 Aug 21;4(3):23.