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**Literature search results**

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**Search details**

- Neonatal abstinence syndrome

**Resources searched**

- NHS Evidence; TRIP Database; Cochrane Library; CINAHL; EMBASE; MEDLINE; Google Scholar

**Database search terms**

- ("neonatal abstinence syndrome" OR NAS), NEONATAL ABSTINENCE SYNDROME, (postnatal OR "post natal" OR post-natal OR postpartum OR "post partum" OR post-partum), (prenatal OR "pre natal" OR pre-natal), ("neonatal withdrawal syndrome" OR NWS OR "neonatal withdrawal")

**Google search string**

- neonatal abstinence syndrome OR neonatal withdrawal syndrome

**Summary**

- Lots of published research so if you would like a more specific search please ask, no guidelines and a few evidence-based reviews.

**Guidelines**

- None found

**Evidence-based reviews**

- **Addiction**
  - Methadone dose and neonatal abstinence syndrome: systematic review and meta-analysis, 2010
  - Severity of the neonatal abstinence syndrome does not appear to differ according to whether mothers are on high- or low-dose methadone maintenance therapy.

**Cochrane Database of Systematic Reviews**
Sedatives for opiate withdrawal in newborn infants, 2010
Infants with NAS due to opiate withdrawal should receive initial treatment with an opiate. Where a sedative is used, phenobarbitone should be used in preference to diazepam. In infants treated with an opiate, the addition of phenobarbitone or clonidine may reduce withdrawal severity. Further studies are needed to determine the role of sedatives in infants with NAS due to opiate withdrawal and the safety and efficacy of adding phenobarbitone or clonidine in infants treated with an opiate for NAS.

Journal of Pediatrics
Relationship between Maternal Methadone Dose at Delivery and Neonatal Abstinence Syndrome, 2010
No correlation was found between maternal methadone dose and rate of NAS. However, higher doses of methadone were associated with decreased illicit opiate abuse at delivery.

New England Journal of Medicine
Neonatal Abstinence Syndrome after Methadone or Buprenorphine Exposure, 2010
These results are consistent with the use of buprenorphine as an acceptable treatment for opioid dependence in pregnant women.

Published research

Author(s): Goodman D
Citation: Journal of Midwifery & Women's Health, May 2011, vol./is. 56/3(240-7), 1526-9523;1542-2011 (2011 May-Jun)
Publication Date: May 2011
Abstract: Opioid dependence during pregnancy is associated with significant health risks for both the mother and her fetus. Opioid maintenance therapy with methadone (Dolophine) is the current standard of care, reduces medical and social risks associated with illicit drug use, and decreases rates of prematurity and low birth weight. However, treatment with methadone is frequently associated with neonatal abstinence syndrome. Buprenorphine is an alternative to methadone that preliminary data indicates is equivalent in safety and efficacy to methadone and significantly increases access to treatment. The pharmacology of buprenorphine and its implications for the care of pregnant women with opioid dependence are described. Copyright 2011 by the American College of Nurse-Midwives.

7. Infant neurobehavior following prenatal exposure to methadone or buprenorphine: results from the neonatal intensive care unit neurobehavioral scale.
Author(s): Jones HE, O’Grady KE, Johnson RE, Velez M, Jansson LM
Citation: Substance Use & Misuse, November 2010, vol./is. 45/13(2244-57), 1082-6084;1532-2491 (2010 Nov)
Publication Date: November 2010
Abstract: This study examined the neurobehavioral functioning of neonates prenatally exposed to methadone (n = 11) or buprenorphine (n = 10), who underwent the Neonatal Intensive Care Unit Network Neurobehavioral Scale (NNNS) examinations on days 3, 5, 7, 10, and 14 post-delivery. Linear mixed model analyses revealed that NNNS scores of arousal and excitability showed significant differences between medications over time. Compared to neonates who did not require medication to treat neonatal abstinence syndrome (NAS), neonates receiving pharmacotherapy for NAS showed differences over time in quality of movement, excitability, and lethargy. Results suggest the NNNS may detect subtle differences over time between both neonates prenatally exposed to methadone or buprenorphine and neonates pharmacologically treated or untreated for NAS.
Source: MEDLINE
Full Text: Available in fulltext at EBSCO Host

Abstract: ROOMING-IN, the practice of caring for mother and newborn together in the same room immediately from birth, is preferred for the general postpartum population but is not yet standard practice of care for newborns of substance-using women. Such newborns are usually separated from their mothers and admitted to a neonatal intensive care unit and treated for substance withdrawal if necessary. We compared clinical and psychosocial outcomes associated with traditional standard care models versus an interdisciplinary rooming-in model of care for substance-exposed newborns.

METHODS: We conducted a retrospective comparative review of a cohort of substance-exposed newborns. Data were extracted from the British Columbia Perinatal Health Program database to populate the standard care and rooming-in groups. The main study outcomes were neonatal admission to NICU, breastfeeding, presence of neonatal withdrawal, length of stay, and custody status at discharge.

RESULTS: Rooming-in was associated with a significant decrease in admissions to NICU and a shorter NICU length of stay for term infants, increased likelihood of breastfeeding (either exclusively or in combination with formula) during the hospital stay, and increased odds of the baby being discharged home with the mother. There were no significant differences between groups with respect to the presence of neonatal substance withdrawal or breastfeeding status at discharge.

CONCLUSION: Rooming-in may facilitate a smooth transition to extrauterine life for substance-exposed newborns by decreasing NICU admissions and NICU length of stay for term infants, encouraging breastfeeding, and increasing maternal custody of infants at discharge. This review supports the finding that rooming-in is both safe and beneficial for substance-exposed babies.

Source: MEDLINE

10. Neonatal abstinence syndrome after methadone or buprenorphine exposure.

Abstract: BACKGROUND: Methadone, a full mu-opioid agonist, is the recommended treatment for opioid dependence during pregnancy. However, prenatal exposure to methadone is associated with a neonatal abstinence syndrome (NAS) characterized by central nervous system hyperirritability and autonomic nervous system dysfunction, which often requires medication and extended hospitalization. Buprenorphine, a partial mu-opioid agonist, is an alternative treatment for opioid dependence but has not been extensively studied in pregnancy.

METHODS: We conducted a double-blind, double-dummy, flexible-dosing, randomized, controlled study in which buprenorphine and methadone were compared for use in the comprehensive care of 175 pregnant women with opioid dependency at eight international sites. Primary outcomes were the number of neonates requiring treatment for NAS, the peak NAS score, the total amount of morphine needed to treat NAS, the length of the hospital stay for neonates, and neonatal head circumference.

RESULTS: Treatment was discontinued by 16 of the 89 women in the methadone group (18%) and 28 of the 86 women in the buprenorphine group (33%). A comparison of the 131 neonates whose mothers were followed to the end of pregnancy according to treatment group (with 58 exposed to buprenorphine and 73 exposed to methadone) showed that the former group required significantly less morphine (mean dose, 1.1 mg vs. 10.4 mg; P<0.0091), had a significantly shorter hospital stay (10.0 days vs. 17.5 days, P<0.0091), and had a significantly shorter duration of treatment for the neonatal abstinence syndrome (4.1 days vs. 9.9 days, P<0.003125) (P values calculated in accordance with prespecified thresholds for significance). There were no significant differences between groups in other primary or secondary outcomes or in the rates of maternal or neonatal adverse events.
Author(s): Bandstra ES, Morrow CE, Mansoor E, Accornero VH
Citation: Journal of Addictive Diseases, April 2010, vol./is. 29/2(245-58), 1055-0887;1545-0848 (2010 Apr)
Publication Date: April 2010
Abstract: This manuscript provides an overview of the current scientific literature on the impact of maternal drug use, specifically opioids and cocaine, during pregnancy on the acute and long-term outcomes of infants and toddlers from birth through age 3 years. Emphasis with regard to opioids is placed on heroin and opioid substitutes used to treat opioid addiction, including methadone, which has long been regarded as the standard of care in pregnancy, and buprenorphine, which is increasingly being investigated and prescribed as an alternative to methadone. Controlled studies comparing methadone at high and low doses, as well as those comparing methadone with buprenorphine, are highlighted and the diagnosis and management of neonatal abstinence syndrome is discussed. Over the past two decades, attention of the scientific and lay communities has also been focused on the potential adverse effects of cocaine and crack cocaine, especially during the height of the cocaine epidemic in the United States. Herein, the findings are summarized from prospective studies comparing cocaine-exposed with non-cocaine-exposed infants and toddlers with respect to anthropometric growth, infant neurobehavior, visual and auditory function, and cognitive, motor, and language development. The potentially stigmatizing label of the so-called “crack baby” preceded the evidence now accumulating from well-designed prospective investigations that have revealed less severe sequelae in the majority of prenatally exposed infants than originally anticipated. In contrast to opioids, which may produce neonatal abstinence syndrome and infant neurobehavioral deficits, prenatal cocaine exposure appears to be associated with what has been described as statistically significant but subtle decrements in neurobehavioral, cognitive, and language function, especially when viewed in the context of other exposures and the caregiving environment which may mediate or moderate the effects. Whether these early findings may herald more significant learning and behavioral problems during school-age and adolescence when the child is inevitably confronted with increasing social and academic challenges is the subject of ongoing longitudinal research.
Source: MEDLINE
Full Text: Available in fulltext at EBSCO Host

19. Neonatal abstinence syndrome--postnatal ward versus neonatal unit management.
Author(s): Saiki T, Lee S, Hannam S, Greenough A
Citation: European Journal of Pediatrics, January 2010, vol./is. 169/1(95-8), 0340-6199;1432-1076 (2010 Jan)
Publication Date: January 2010
Abstract: AIM: The aim of this cohort study was to test the hypothesis that caring for infants with neonatal abstinence syndrome (NAS) with their mothers on the postnatal ward rather than admit them to the neonatal unit would reduce treatment duration and length of hospital stay.RESULTS: The outcomes of infants with NAS cared for in 2002-2005 (Group A, n = 42) and 2006-2007 (Group B, n = 18) were compared. Group A infants were admitted to the neonatal unit for assessment and treatment as necessary, but Group B infants remained on the postnatal ward with their mother. Sixty infants (median gestational age 39, range 26-42 weeks) were included in the study. The proportion of infants in Group B compared to Group A requiring treatment for NAS was lower (45% versus 11%, p = 0.012) and the durations of treatment (mean 12.7 versus 7.3 days, p = 0.05) and hospital stay (mean 19.8 versus 15.9 days, p = 0.012) were shorter in Group B. No infant in either group was readmitted within the next 2 months.CONCLUSIONS: These results suggest caring for infants with NAS on the postnatal ward rather than the neonatal unit reduces the need for treatment and duration of hospital stay.
Source: MEDLINE

21. Infant autonomic functioning and neonatal abstinence syndrome.
Author(s): Jansson LM, Dipietro JA, Elko A, Veliz M
Abstract: BACKGROUND: Neonatal abstinence syndrome (NAS) expression is widely variable among affected infants and the reasons for this variability are largely unknown; mechanisms that predispose infants to NAS expression are not understood. It has been postulated that the regulatory problems of prenatally drug exposed infants are manifested in dysfunctional vagal regulation of autonomic processes. The current study examines whether cardiac vagal tone, an indicator of parasympathetic neuroregulation, provides a marker for autonomic dysregulation subsequently expressed as NAS in prenatally opioid-exposed newborns.

METHODS: Heart period (HP) and cardiac vagal tone (V) were derived from electrocardiogram data collected from 64 methadone-exposed infants on postnatal days 1 and 3. The postpartum NAS course was assessed serially. RESULTS: Infants with lower V on day 1 had significantly higher NAS symptomatology on day 3. Boys had more severe NAS symptoms than girls through the first 4 days of life and, among infants receiving pharmacologic treatment for NAS, boys required longer treatment course and hospitalizations. Greater poly-drug exposure, detected through toxicology screening throughout pregnancy, and cocaine use in particular, were associated with lower V and shorter HP (faster heart rate) in newborns. Multiple regression models accounted for 25-35% of the variance in NAS symptoms and duration of hospitalization in methadone-exposed infants.

CONCLUSIONS: Results support the hypothesis of a biologic vulnerability of autonomic regulatory functioning in methadone-exposed infants and greater male infant vulnerability to maternal methadone use. Copyright (c) 2010 Elsevier Ireland Ltd. All rights reserved.

Source: MEDLINE


Author(s): Winklbaur B, Baewert A, Jagsch R, Rohrmeister K, Metz V, Aeschbach Jachmann C, Thau K, Fischer G

Citation: European Addiction Research, 2009, vol./is. 15/3(150-6), 1022-6877;1421-9891 (2009)

Publication Date: 2009

Abstract: BACKGROUND: Prenatal nicotine exposure is associated with increased neonatal mortality, low birth weight, and smaller head circumference. Opioid-dependent pregnant women show a particularly high prevalence of tobacco smoking and are at greater risk for additional adverse events. However, little is known about the impact of tobacco smoking on opioid-maintained pregnant women and neonatal outcomes.

PATIENTS AND METHODS: This study examined the effect of cigarette smoking on 139 opioid-maintained pregnant women and their neonates. Forty-five percent of the participants were maintained on slow-release oral morphine (SROM), 39% received methadone maintenance, and 16% received buprenorphine. Participants were divided into two groups: (1) women who reported a low cigarette consumption of < or =10 cigarettes/day (56.8%) and (2) those reporting heavy consumption of > or =20 cigarettes/day (43.2%). Neonatal outcome measures were assessed, and a standardized Finnegan score was applied to determine the neonatal abstinence syndrome (NAS).

RESULTS: Fifty-two percent of the newborns did not require treatment for NAS (54% of neonates born to methadone-maintained mothers, 30% born to SROM-maintained mothers, and 95% born to buprenorphine-maintained mothers; p < 0.001). Heavy cigarette consumption was associated with significantly lower neonatal birth weight (p < 0.001), smaller birth length (p = 0.017) as well as with the severity of NAS (p = 0.03). With regard to concomitant consumption of opioids (p = 0.54), cocaine (p = 0.25), amphetamines (p = 0.90) or benzodiazepines (p = 0.09), no significant differences between heavy or low nicotine consumption were noted.

CONCLUSION: Heavy tobacco smoking in opioid-maintained pregnant women is associated with adverse medical and developmental consequences for the newborn. Future treatment programs for this target group should focus on an individualized approach to opioid maintenance therapy in addition to offering specially tailored counseling for smoking cessation. Copyright 2009 S. Karger AG, Basel.

Source: MEDLINE

Full Text: Available in fulltext at EBSCO Host
24. Characterization of babies discharged from Cabell Huntington Hospital during the calendar year 2005 with the diagnoses of neonatal abstinence syndrome.

Author(s): Baxter FR, Nerhood R, Chaffin D

Citation: West Virginia Medical Journal, March 2009, vol./is. 105/2(16-21), 0043-3284;0043-3284 (2009 Mar-Apr)

Publication Date: March 2009

Abstract: Recent concern regarding the impact of maternal drug abuse on neonatal well being was the impetus for this retrospective cohort study of newborns diagnosed with neonatal abstinence syndrome that were discharged from Cabell Huntington Hospital during the calendar year 2005. Medical records of the neonates and their mothers were analyzed for a variety of health related outcomes and healthcare cost. Forty-eight neonates were diagnosed with Neonatal Abstinence Syndrome in 2005, forty of which required NICU assistance. The average maternal age at delivery was 26; gravity was 3.1 and most were single, separated or divorced. The majority had poor or inconsistent prenatal care. Twenty-one delivered by cesarean section most often for fetal distress. Most delivered prematurely with an average gestation of 35.9 weeks. Half of the mothers went into preterm labor with half of those having premature ruptured membranes. Opiates were the most common maternal substance found, while neonates most often tested positive for methadone. Nearly 90% of the mothers smoked. Thirty-four of the mothers were found to continue illicit drug abuse while pregnant, while another eight were seen in a methadone clinic for a history of abuse. Most of the neonates required weaning with methadone. The majority of our study cases were funded by Medicaid, mostly by West Virginia with total hospital costs exceeding 1.7 million dollars. Direct cost attributed to detoxification was in excess of $180,000. The number of neonates diagnosed with Neonatal Abstinence Syndrome has nearly tripled from 2003 to 2007. The problem of maternal drug abuse and addiction during pregnancy has dramatic effects on both their unborn children and our local healthcare system. Increased awareness of this growing problem is needed so that earlier interventions can be implemented. It is our opinion that all obstetrical patients at risk should be screened early and often so that those affected individuals can be managed more aggressively to improve neonatal outcomes.

Source: MEDLINE

Available in print at Lincoln County Hospital Professional Library

29. Prenatal methadone exposure and neonatal neurobehavioral functioning.

Author(s): Velez ML, Jansson LM, Schroeder J, Williams E

Citation: Pediatric Research, December 2009, vol./is. 66/6(704-9), 0031-3998;1530-0447 (2009 Dec)

Publication Date: December 2009

Abstract: Opioid-exposed infants display a wide and variable range of dysregulated neurobehavioral functioning, but the regulatory difficulties experienced by these infants outside the defined clusters of neonatal abstinence syndrome (NAS) have not been well described and may have implications for the infant’s developmental course. This study describes the neurobehavioral functioning of neonates prenatally exposed to methadone, using the NICU Network Neurobehavioral Scale (NNNS), and explores the relationships between maternal factors and infant functioning. The relationship between NNNS measures, NAS severity, and need for pharmacotherapy for NAS was also evaluated. Infants who required pharmacologic treatment for NAS showed more dysregulated behavior and signs of stress and abstinence as indicated by NNNS scores, but NNNS scores were not significantly correlated with maternal methadone dose. The determination of the range of the methadone-exposed infant’s neurobehavioral repertoire could guide the optimal treatment of all such infants, particularly those requiring only nonpharmacologic care.

Source: MEDLINE

30. The Opioid dependent mother and newborn dyad: non-pharmacologic care.

Author(s): Velez M, Jansson LM

Citation: Journal of Addiction Medicine, September 2008, vol./is. 2/3(113-20), 1932-0620;1932-0620 (2008 Sep)

Publication Date: September 2008

Abstract: Opioid dependent pregnant and post-partum women and their infants are a complex and vulnerable population requiring individualized, comprehensive and multidisciplinary treatment. Though methadone maintenance in the setting of comprehensive service provision during pregnancy significantly improves pregnancy
outcomes for opioid dependent women, its use has implications for the infant, most notably the Neonatal Abstinence Syndrome (NAS). NAS is comprised of physiologic signs and behaviors that indicate a dysfunctional regulation of the central and autonomic nervous systems, and is variable in its expression in affected infants. The disorganized rather than adaptive behaviors displayed by each infant undergoing the effects of in-utero opioid exposure may impair basic functions such as feeding, sleeping, and the ability to be alert and communicate clear cues to caregivers. Understanding and responding to neurobehavioral dysfunction of the newborn may help to promote the infant's self-organization and self-regulating abilities. However, the substance abusing mother's physical and psychological wellbeing may be debilitated in the perinatal period, and her ability to recognize and respond to the newborn's cues may be limited. A multi-tiered comprehensive assessment and intervention of the methadone-maintained mother, her child, and the mother/infant dyad can improve early maternal nurturing interactions, a crucial component of early infant development, particularly in this vulnerable population. The purpose of this article is to review the contribution of maternal opioid dependency to the difficulties experienced by the mother-infant dyad and their treatment providers in the postnatal period, and the non-pharmacological treatment of the infants with suggestions for practical measures with emphasis on the treatment of the mother and baby as an interactional dyad.

Source: MEDLINE

37. Prospective randomised comparative study of the effect of buprenorphine, methadone and heroin on the course of pregnancy, birthweight of newborns, early postpartum adaptation and course of the neonatal abstinence syndrome (NAS) in women followed up in the outpatient department.

Author(s): Binder T, Vavrinkova B
Citation: Neuroendocrinology Letters, February 2008, vol./is. 29/1(80-6), 0172-780X;0172-780X (2008 Feb)
Publication Date: February 2008
Abstract: OBJECTIVE: The aim of the study was to evaluate the effect of substitution therapy in heroin addicted pregnant women on the course of pregnancy, perinatal outcomes and course of the neonatal abstinence syndrome.DESIGN OF THE STUDY: A five-year randomised prospective comparative study METHODS: The study was carried out in the period of 2002-2007. The group of patients included 147 i.v. heroin-addicted pregnant women. All of them were outpatients of our Perinatal Care Unit. Their daily dose of heroin was approximately lg. Later, 30 women were disqualified from the study for breaking the randomised criteria engagement. The substitution therapy in women who agreed to undergo it, started during the I. trimester of pregnancy. Finally, 47 heroin, 32 methadone and 38 buprenorphine addicted women were enrolled in the study. Birthweight of newborns was compared with the national birthweight tables. Severity and duration of neonatal abstinence syndrome (NAS) were evaluated by Finnegan s score scale.RESULTS: None of the women delivered before the end of 34th gestational week. We did not encounter any perinatal death or developmental defect. The lowest birthweight, the highest number of newborns with IUGR and the most numerous placental changes were found in the group of heroin-addicted women. The differences compared to the two groups receiving substitution therapy were statistically significant (p < 0.05). The severity and course of NAS were the most severe (p < 0.001) in newborns of women from the methadone group.CONCLUSION: Comparison of the groups of outpatients is in many ways questionable because of the restricted possibility of the patients' control. The lifestyle of addicted women has the same impact as the drug use alone. This is probably the main reason for differences in some of the monitored parameters between individual groups. Based on our results we can state that substitution therapy provides pregnant women with the possibility of social stabilization and adequate prenatal care. substitution therapy decreases the street heroin consumption. Methadone notably protracts the newborn's abstinence syndrome. With regard to this fact, attention has been recently focused on substitution with buprenorphine that seems to be from this viewpoint a more considerate option.

Source: MEDLINE

38. Prenatal methamphetamine use and neonatal neurobehavioral outcome.

Citation: Neurotoxicology & Teratology, January 2008, vol./is. 30/1(20-8), 0892-0362;0892-
Abstract: BACKGROUND: Methamphetamine (MA) use among pregnant women is an increasing problem in the United States. How prenatal MA exposure affects neonatal neurobehavior is unknown. OBJECTIVE: To examine the neurobehavioral effects of prenatal MA exposure. DESIGN: The Infant Development, Environment and Lifestyle (IDEAL) study screened 13,808 subjects and 1632 were eligible and consented. 166 (n=74 exposed) were enrolled in a longitudinal follow-up. Exposure was determined by meconium assay and self-report with alcohol, marijuana, and tobacco present in both groups. The NICU Network Neurobehavioral Scale (NNNS) was administered within the first 5 days of life. Analyses conducted on NNNS summary scores included exposure group effects, heavy MA use effects, association with frequency of use by trimester, and dose-response relationships with amphetamine metabolites. RESULTS: After adjusting for covariates, exposure to MA was associated with increased physiological stress. Heavy MA use was related to lower arousal, more lethargy, and increased physiological stress. First trimester MA use was related to elevated stress abstinence. Third trimester use was related to poorer quality of movement. Higher level of amphetamine metabolites in meconium was associated with increased CNS stress. CONCLUSIONS: Prenatal MA exposure was associated with neurobehavioral patterns of decreased arousal, increased stress, and poor quality of movement. The dose-response relationships may represent neurotoxic effects from MA.

Source: MEDLINE

54. In utero exposure to smoking and newborn neurobehavior: how to assess neonatal withdrawal syndrome?
Author(s): Pichini S, Garcia-Algar O
Citation: Therapeutic Drug Monitoring, June 2006, vol./is. 28/3(288-90), 0163-4356/0163-4356 (2006 Jun)
Publication Date: June 2006
Abstract: Recent studies postulate neurotoxic effects of prenatal tabacco exposure, passive addiction, and neonatal nicotine withdrawal syndrome in newborns in utero exposed to maternal smoking. The neonatal withdrawal syndrome is characterized by irritability, tremors, and sleep disturbances, most typically observed in newborns of heavy smoking mothers.
Source: MEDLINE

1. The management of heroin misuse in pregnancy: time for a rethink?
Author(s): Mactier H
Citation: Archives of Disease in Childhood -- Fetal & Neonatal Edition, 01 November 2011, vol./is. 96/6(0-), 13592998
Publication Date: 01 November 2011
Abstract: Heroin use in pregnancy is a worldwide problem. Methadone maintenance treatment has definite advantages for the mother and is currently recommended in the UK. There is, however, increasing evidence of adverse effects upon developing cortical and visual function in children of treated heroin-addicted mothers. The longer-term implications of this are not yet clear, and are confounded by poly-drug misuse and ongoing social deprivation. There is a paucity of evidence regarding outcome for infants who require pharmacological treatment for neonatal abstinence syndrome compared to those who have only mild symptoms. Well-controlled studies of the treatment of heroin misuse in pregnancy that take account of both neonatal and longer term outcomes for the child are urgently required.
Source: CINAHL
Full Text: Available in fulltext at Highwire Press

2. Update on the pharmacologic management of neonatal abstinence syndrome.
Author(s): Bio, L L, Siu, A, Poon, C Y
Citation: Journal of Perinatology, 01 November 2011, vol./is. 31/11(692-701), 07438346
Publication Date: 01 November 2011
Abstract: Although a statement on Neonatal Drug Withdrawal was published in 1998 by the American Academy of Pediatrics, pharmacologic management of neonatal abstinence syndrome (NAS) remains a challenge. Published clinical trials are limited, restricting treatment decision making to practitioner’s experience and preference rather than...
To optimize withdrawal symptom prevention, drug selection is often based on the offending agent (opioids versus polysubstance exposure), clinical presentation, mechanism of action (agonist versus partial agonist/antagonist, receptor effects), pharmacokinetic parameters and available drug formulations. This review addresses risk factors and pathophysiology of NAS, summarizes parameters of common drugs used for the management of NAS, and reviews published literature of standard therapies as well as newer agents. Based on the current literature, paregoric is no longer recommended and oral morphine solutions remain the mainstay of therapy for opiate withdrawal. Other potential therapies include methadone, buprenorphine, phenobarbital and clonidine with the latter two agents as adjunctive therapies.

Source: CINAHL

8. **Long-term outcome following selective serotonin reuptake inhibitor induced neonatal abstinence syndrome.**
Author(s): Klinger, G, Frankenenthal, D, Merlob, P, Diamond, G, Sirota, L, Levinson-Castiel, R, Linder, N, Stahl, B, Inbar, D Citation: Journal of Perinatology, 01 September 2011, vol./is. 31/9(615-620), 07438346 Publication Date: 01 September 2011 Abstract: Objective: To assess the long-term neurodevelopment of children exposed in utero to selective serotonin reuptake inhibitors (SSRIs) that developed a neonatal abstinence syndrome (NAS). Study Design: Neurodevelopmental evaluation was performed at the age of 2 to 6 years. Children who developed NAS were compared with those who did not using univariate and logistic regression analyses. Result: Thirty children with NAS and 52 without NAS participated in the study. Both groups were similar in mean cognitive ability (106.9±14.0 vs 100.5±14.6, P=0.12) and developmental scores (98.9±11.4 vs 95.7±9.9, P=0.21). However, there was a trend towards small head circumference in the NAS group (20 vs 6%, P=0.068). NAS was associated with an increased risk of social-behavior abnormalities (odds ratio (OR) 3.03, 95% confidence interval (CI) 1.07 to 8.60, P=0.04) and advanced maternal age (OR 1.12, 95% CI 1.00 to 1.25, P=0.04). Conclusion: Infants who developed NAS had normal cognitive ability, but were at an increased risk for social-behavioral abnormalities. Follow-up evaluation of symptomatic neonates should be considered.
Source: CINAHL

12. **The impact of infant feeding method on neonatal abstinence scores of methadone-exposed infants.**
Author(s): McQueen, Karen A, Murphy-Oikonen, Jodie, Gerlach, Keri, Montelpare, William Citation: Advances in Neonatal Care (Elsevier Science), 01 August 2011, vol./is. 11/4(282-290), 15360903 Publication Date: 01 August 2011 Abstract: PURPOSE: To determine whether neonatal abstinence scores of infants exposed to methadone in utero differed by infant feeding method. DESIGN: A retrospective chart review. SUBJECTS: Twenty-eight term infants that were exposed to methadone in utero and exhibited symptoms of neonatal abstinence syndrome (NAS) prior to hospital discharge were included into the study. The sample was further divided by self-selected infant feeding method including (1) predominately breastfed (n=8), combination fed (n=11) or predominately formula fed (n=9). METHODS: Data were extracted by two independent researchers from both the mother's and infant's chart. This included variables such as NAS scores, NAS treatment, infant feeding method and baseline demographic information. MAIN OUTCOME MEASURES: NAS scores were assessed by Registered Nurses according to hospital protocol using a Modified Finnegan Scoring Tool. PRINCIPAL RESULTS: A non-parametric Kruskal-Wallis one way analysis of variance based on ranks revealed statistically significant differences in the number of NAS scores recorded (P = 0.001), magnitude (P < 0.0001) and area score (P = 0.04) by infant feeding method. In particular, infants who were predominantly breastfed had significantly fewer NAS scores done and lower mean scores suggesting decreased severity and duration of NAS symptoms when compared to infants who were combination fed or predominately formula fed. CONCLUSION: Breastfeeding may offer enhanced benefits for infants who have been exposed to methadone in utero. As such, in the absence of contraindications, mothers in methadone maintenance programs should be encouraged and supported to breastfeed their infants.
Source: CINAHL
15. Association between intrapartum fetal heart rate patterns and neonatal abstinence syndrome in methadone exposed neonates.
Author(s): Leeman LM, Brown SA, Albright B, Skipper B, Hsi A, Rayburn WF
Citation: Journal of Maternal-Fetal & Neonatal Medicine, 01 July 2011, vol./is. 24/7(955-959), 14767058
Publication Date: 01 July 2011
Source: CINAHL

17. An evidence-based intervention for promoting sleep in infants experiencing neonatal abstinence syndrome (NAS) due to maternal methadone use... 2011 Annual Conference of the National Association of Clinical Nurse Specialists.
Author(s): Hiles, Marianne
Citation: Clinical Nurse Specialist: The Journal for Advanced Nursing Practice, 01 May 2011, vol./is. 25/3(154-154), 08876274
Publication Date: 01 May 2011
Source: CINAHL

23. Revised dose schema of sublingual buprenorphine in the treatment of the neonatal opioid abstinence syndrome.
Author(s): Kraft, Walter K., Dysart, Kevin, Greenspan, Jay S., Gibson, Eric, Kaltenbach, Karol, Ehrlich, Michelle E.
Citation: Addiction, 01 March 2011, vol./is. 106/3(574-580), 09652140
Publication Date: 01 March 2011
Abstract: Aims More than half of infants exposed to opioids in utero develop neonatal abstinence syndrome (NAS) of severity to require pharmacological therapy. Current treatments are associated with prolonged hospitalization. We sought to optimize the dose of sublingual buprenorphine in the treatment of NAS. Design Randomized, Phase 1, open-label, active-control clinical trial comparing sublingual buprenorphine to oral morphine. Setting Large, urban, tertiary care hospital. Participants Twenty-four term infants requiring pharmacological treatment for NAS. Measurements Outcomes were neonatal safety, length of treatment and length of hospitalization. Findings Sublingual buprenorphine was safe and effective. Infants treated with buprenorphine had a 23-day length of treatment compared to 38 days for those treated with morphine (P = 0.01), representing a 40% reduction. Length of hospital stay in the buprenorphine group was reduced 24%, from 42 to 32 days (P = 0.05). Conclusions Sublingual buprenorphine was safe in NAS, with a substantial efficacy advantage over standard of care therapy with oral morphine.add 3170 574..580
Source: CINAHL

Author(s): Clark, Crystal T., Richards, Erica M., Antoine II, Denis G., Chisolm, Margaret S.
Citation: Addictive Disorders & Their Treatment, 01 March 2011, vol./is. 10/1(1-5), 15315754
Publication Date: 01 March 2011
Abstract: The prevalence of toluene abuse in women of reproductive age is growing and little is known about toluene's effects on neonatal outcomes. The authors report the case of a 28-year-old woman with major depression, panic disorder, and multi-drug dependence (nicotine, cocaine, opiates, and toluene) and discuss approaches to the evaluation and treatment of these clinically complex patients. The authors also suggest preventive measures as well as areas for future research.
Source: CINAHL

Author(s): Kellogg A, Rose CH, Harms RH, Watson WJ
Citation: American Journal of Obstetrics & Gynecology, 01 March 2011, vol./is. 204/3(0-), 00029378
Publication Date: 01 March 2011
Abstract: OBJECTIVE: The purpose of this study was to evaluate trends and prevalence of chronic prescription narcotic use during pregnancy and the subsequent neonatal outcomes. STUDY DESIGN: We conducted a retrospective cohort study of all deliveries at Mayo Clinic from 1998 through 2009; the data was obtained from prospectively maintained obstetrics and neonatal databases. RESULTS: Over the study time period, there were 26,314 deliveries; 187 women used prescription narcotics chronically during pregnancy. The prevalence of women who used chronic narcotics during their pregnancy increased over
the time period from 1998-2009 (P < .0001). Neonatal withdrawal syndrome occurred in 10 of neonates (5.6%), and all but 1 of these neonates required pharmacologic treatment for the disease. CONCLUSION: Chronic narcotic use during pregnancy is increasing in prevalence. Neonatal withdrawal syndrome occurred in 5.6% of the exposed neonates. Although neonatal withdrawal syndrome is uncommon, it is clinically significant. Physicians need to consider the risks and benefits carefully when prescribing narcotic pain medications during pregnancy.

Source: CINAHL

29. Active ear acupuncture points in neonates with neonatal abstinence syndrome (nas).
Author(s): Raith W, Kutschera J, Müller W, Urlesberger B
Citation: American Journal of Chinese Medicine, 01 February 2011, vol./is. 39/1(29-37), 0192415X
Publication Date: 01 February 2011
Abstract: The aim of the study was to determine the presence of acupuncture ear points in neonates with Neonatal Abstinence Syndrome (NAS). NAS occurs in the first days of life in neonates whose mothers have a history of drug abuse, and may also occur in neonates whose mothers are currently following substitution therapy. The patients are neonates with NAS admitted over one year to the Division of Neonatology at the University Hospital Graz. The examination took place on the third day after delivery (mean value 70.3 hours) and was performed by a neuronal pen (PS 3 © Silberbauer, Vienna, Austria). An integrated sound and optical signal detected the active ear points that were then placed on an ear map. We investigated six neonates (four male, two female). All investigated neonates showed the presence of active ear acupuncture points. The psychovegetative rim was the most common organic area of the children, following by a few organic points. This corresponds with the results found in healthy neonates. In all neonates with NAS, we found the presence of psychic ear points. The identified psychic ear points are the frustration-point, R-point and the psychotropic area nasal from the incisura intertragica. In all neonates with NAS, active organic and psychic ear points were detectable in both ears. In the future, it could be possible to use active ear points for diagnostic and therapeutic purposes.

Source: CINAHL

Author(s): Cleary BJ, Donnelly JM, Strawbridge JD, Gallagher PJ, Fahey T, White MJ, Murphy DJ
Citation: American Journal of Obstetrics & Gynecology, 01 February 2011, vol./is. 204/2(0- ), 00029378
Publication Date: 01 February 2011
Abstract: The purpose of this study was to examine the relationship among methadone maintenance treatment, perinatal outcomes, and neonatal abstinence syndrome.

Source: CINAHL

33. Maternal and neonatal factors impacting response to methadone therapy in infants treated for neonatal abstinence syndrome.
Author(s): Isemann B, Meinzen-Derr J, Akinbi H
Citation: Journal of Perinatology, 01 January 2011, vol./is. 31/1(25-29), 07438346
Publication Date: 01 January 2011
Abstract: Objective: To identify maternal and neonatal factors that impact response to methadone therapy for neonatal abstinence syndrome. Study Design: This is a retrospective review of 128 infants that received pharmacotherapy for opiate withdrawal to identify factors associated with favorable response to methadone therapy. Maternal and neonatal data were analyzed with univariate statistics and multivariate logistic regression. Result: Maternal methadone maintenance dose during pregnancy correlated with length of stay (P=0.009). There was an inverse correlation between the amount of mother’s breast milk ingested and length of stay (β =−.03, P=0.02). Methadone was initiated later, tapered more rapidly and was more successful as monotherapy in preterm infants. Five percent of infants were admitted to hospital again for rebound withdrawal following reduction of breast milk intake. Conclusion: Severity of neonatal abstinence syndrome may be mitigated by titrating methadone to the lowest effective dose during pregnancy and by encouraging breast milk feeds, which should be weaned gradually.

Source: CINAHL
35. Buprenorphine produces less withdrawal in babies than methadone.
Citation: Alcoholism & Drug Abuse Weekly, 13 December 2010, vol./is. 22/47(1-3), 10421394
Publication Date: 13 December 2010
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host

37. Methadone dose and neonatal abstinence syndrome-systematic review and meta-analysis.
Author(s): Cleary BJ, Donnelly J, Strawbridge J, Gallagher PJ, Fahey T, Clarke M, Murphy DJ
Citation: Addiction, 01 December 2010, vol./is. 105/12(2071-2084), 09652140
Publication Date: 01 December 2010
Abstract: Aim To determine if there is a relationship between maternal methadone dose in pregnancy and the diagnosis or medical treatment of neonatal abstinence syndrome (NAS). Methods PubMed, EMBASE, the Cochrane Library and PsychINFO were searched for studies reporting on methadone use in pregnancy and NAS (1966-2009). The relative risk (RR) of NAS was compared for methadone doses above versus below a range of cut-off points. Summary RRs and 95% confidence intervals (CI) were estimated using random effects meta-analysis. Sensitivity analyses explored the impact of limiting meta-analyses to prospective studies or studies using an objective scoring system to diagnose NAS. Results A total of 67 studies met inclusion criteria for the systematic review; 29 were included in the meta-analysis. Any differences in the incidence of NAS in infants of women on higher compared with lower doses were statistically non-significant in analyses restricted to prospective studies or to those using an objective scoring system to diagnose NAS. Conclusions Severity of the neonatal abstinence syndrome does not appear to differ according to whether mothers are on high- or low-dose methadone maintenance therapy.
Source: CINAHL

Author(s): Liu AJ, Nanan R
Citation: Journal of Pediatrics, 01 December 2010, vol./is. 157/6(1044-1044), 00223476
Publication Date: 01 December 2010
Source: CINAHL

43. Gender and NAS: Does sex matter?
Author(s): Holbrook A, Kaltenbach K
Citation: Drug & Alcohol Dependence, 01 November 2010, vol./is. 112/1-2(156-159), 03768716
Publication Date: 01 November 2010
Abstract: BACKGROUND: Neonatal abstinence syndrome (NAS) is a constellation of symptoms resulting from in utero exposure to opioids that appears in 30-80% of opioid exposed infants. Variability in NAS symptoms is not well understood, and recently it has been suggested that the sex of the infant may play a role in predicting NAS severity. The current study examines the relationship of sex to need for NAS treatment, length of NAS treatment, and peak dose of medication required to treat NAS symptoms. METHODS: Retrospective chart review of 308 infants was conducted to determine whether significant differences exist between male and female neonates in need for NAS treatment, length of treatment and peak dose of medication required. Chi-square, multiple ordinary least squares regression, and analysis of variance (ANOVA) analyses were conducted. RESULTS: No significant differences were found in need for NAS treatment, length of treatment or peak dose of medication required between male and female neonates. CONCLUSIONS: Results suggest that no significant differences exist in NAS severity between male and female infants.
Source: CINAHL

46. Neonatal abstinence syndrome (NAS) after intrauterine exposure to tramadol.
Author(s): Hartenstein S, Proquitté H, Bauer S, Bamberg C, Roehr CC
Citation: Journal of Perinatal Medicine, 01 November 2010, vol./is. 38/6(695-696),
49. Opiate treatment for opiate withdrawal in newborn infants.
Author(s): Osborn DA, Jeffery HE, Cole MJ
Citation: Cochrane Database of Systematic Reviews, 01 October 2010, vol./is. /10(0-), 1469493X
Abstract: Background:
Source: CINAHL
Full Text: Available in fulltext at Wiley

50. Sedatives for opiate withdrawal in newborn infants.
Author(s): Osborn DA, Jeffery HE, Cole MJ
Citation: Cochrane Database of Systematic Reviews, 01 October 2010, vol./is. /10(0-), 1469493X
Abstract: Background:
Source: CINAHL
Full Text: Available in fulltext at Wiley

54. Is neonatal abstinence syndrome related to the amount of opiate used?
Author(s): Thajam D, Atkinson DE, Sibley CP, Lavender T
Citation: JOGNN: Journal of Obstetric, Gynecologic & Neonatal Nursing, 01 September 2010, vol./is. 39/5(503-509), 08842175
Abstract: Objective: To determine if a relationship exists between the dose of heroin and/or substitute medication used in pregnancy and neonatal abstinence syndrome (NAS). Data Sources: Ovid online was used to search the following: EMBASE, Ovid MEDLINE, CINHAL, PsycINFO, Cochrane Database of Systematic Reviews. Study Selection: English language journal articles reporting original research undertaken and published between 1995 and 2009 that examined relationships between NAS and opiate use in pregnancy and with patterns of substance abuse that reflect those of the United Kingdom and other high-resource settings. Data Extraction: The studies were reviewed independently by two authors using predefined quality criteria. Data Synthesis: This was a narrative review; key messages from included studies were discussed in the context of the diversity and commonality of findings in relation to NAS. Conclusions: No correlation between the amount of fetal opioid exposure and expression of NAS was reported in eight of the 10 studies. This observation was consistent across international boundaries, and studies that included both methadone and buprenorphine.
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host

55. Relationship between maternal methadone dose at delivery and neonatal abstinence syndrome.
Author(s): Seligman NS, Almario CV, Hayes EJ, Dysart KC, Berghella V, Baxter JK
Citation: Journal of Pediatrics, 01 September 2010, vol./is. 157/3(428-434), 00223476
Abstract: Objective: To determine if a relationship exists between the dose of heroin and/or substitute medication used in pregnancy and neonatal abstinence syndrome (NAS). Data Sources: Ovid online was used to search the following: EMBASE, Ovid MEDLINE, CINHAL, PsycINFO, Cochrane Database of Systematic Reviews. Study Selection: English language journal articles reporting original research undertaken and published between 1995 and 2009 that examined relationships between NAS and opiate use in pregnancy and with patterns of substance abuse that reflect those of the United Kingdom and other high-resource settings. Data Extraction: The studies were reviewed independently by two authors using predefined quality criteria. Data Synthesis: This was a narrative review; key messages from included studies were discussed in the context of the diversity and commonality of findings in relation to NAS. Conclusions: No correlation between the amount of fetal opioid exposure and expression of NAS was reported in eight of the 10 studies. This observation was consistent across international boundaries, and studies that included both methadone and buprenorphine.
Source: CINAHL
Full Text: Available in fulltext at Ovid

56. The experiences of NICU nurses in caring for infants with neonatal abstinence syndrome.
Author(s): Murphy-Oikonen J, Brownlee K, Montelpare W, Gerlach K
Citation: Neonatal Network, 01 September 2010, vol./is. 29/5(307-313), 07300832
Abstract: Purpose: This study explored the experiences of NICU nurses in caring for infants with neonatal abstinence syndrome (NAS). Design: A qualitative research approach was used with open-ended questions employing computer-assisted personal interviews. Sample: Fourteen NICU nurses employed in a regional hospital provided responses. Results: The nurses reflected a personal struggle between a desire to employ their technical and critical nursing skills and the need to provide expected maternal care to NAS infants. Other themes included frustration and burnout, challenges to values about parenting, and increased awareness of drug use in the community and at home. Discussion: The results suggest that nurses underrate the skill required to care for infants with NAS. The level of knowledge, patience, and commitment to these newborns should be reframed to increase job satisfaction, and education should be offered to nurses about women struggling with addictions.

Source: CINAHL

Full Text:
Available in fulltext at EBSCO Host
Available in print at Lincoln County Hospital Professional Library

64. Perinatal risk factors for the neonatal abstinence syndrome in infants born to women on methadone maintenance therapy.

Author(s): Liu AJW, Jones MP, Murray H, Cook C, Nanan R
Citation: Australian & New Zealand Journal of Obstetrics & Gynaecology, 01 June 2010, vol./is. 50/3(253-258), 00048666
Publication Date: 01 June 2010
Source: CINAHL
Full Text:
Available in fulltext at EBSCO Host

73. Detection of psychic ear acupuncture points in a newborn infant with neonatal abstinence syndrome.

Author(s): Raith W, Pichler G, Zotter H, Mueller W, Urlesberger B
Citation: Journal of Alternative & Complementary Medicine, 01 April 2010, vol./is. 16/4(345-346), 10755535
Publication Date: 01 April 2010
Source: CINAHL
Full Text:
Available in fulltext at EBSCO Host

76. Finnegan neonatal abstinence scoring system: normal values for first 3 days and weeks 5-6 in non-addicted infants.

Author(s): Zimmermann-Baer U, Notzli U, Rentsch K, Bucher HU
Citation: Addiction, 01 March 2010, vol./is. 105/3(524-528), 09652140
Publication Date: 01 March 2010
Abstract: Objective The neonatal abstinence scoring system proposed by Finnegan is used widely in neonatal units to initiate and to guide therapy in babies of opiate-dependent mothers. The purpose of this study was to assess the variability of the scores in newborns and infants not exposed to opiates during the first 3 days of life and during 3 consecutive days in weeks 5 or 6. Patients and methods Healthy neonates born after 34 completed weeks of gestation, whose parents denied opiate consumption and gave informed consent, were included in this observational study. Infants with signs or symptoms of disease or with feeding problems were excluded. A modified scoring system was used every 8 hours during 72 hours by trained nurses; 102 neonates were observed for the first 3 days of life and 26 neonates in weeks 5-6. A meconium sample and a urine sample at weeks 5-6 were stored from all infants to be analysed for drugs when the baby scored high. Given a non-Gaussian distribution the scores were represented as percentiles. Results During the first 3 days of life median scores remained stable at 2 but the variability increased, with the 95th percentile rising from 5.5 on day 1 to 7 on day 2. At weeks 5-6 median values were higher during daytime (50th percentile = 5, 95th percentile = 8) than night-time (50th percentile = 2, 95th percentile = 6, P = 0.02). Conclusion Scores increase from days 1-3 to weeks 5-6 and show day-night cycles with 5-6 weeks. Values above 8 can be considered pathological. This data may help to raise suspicion of narcotic withdrawal and to guide therapy.

Source: CINAHL
84. Methadone-treated mothers: pregnancy and breastfeeding.

Author(s): Jambert-Gray R, Lucas K, Hall V

Citation: British Journal of Midwifery, 01 October 2009, vol./is. 17/10(654-657), 09694900

Publication Date: 01 October 2009

Abstract: Care and advice given to mothers engaged in treatment for illicit drug use during pregnancy and early motherhood will be influenced by both the midwives’ personal views about drug users and their knowledge and understanding of issues involved. Opiates remain the main drug of choice for pregnant drug users; over the past ten years in the UK there has been a 67% increase of neonatal abstinence syndrome (NAS). As 60-90% of opiate-exposed infants show symptoms of NAS, this article considers methadone treatment in pregnancy and advises that mothers should not reduce their usual therapeutic dose of methadone. Breastfeeding is advised as an optimal solution for not only ameliorating NAS symptoms but also for keeping mother and baby together which leads to better bonding and a shorter hospital stay. This article recommends that midwives receive ongoing opportunities to gain knowledge and understanding of the management of methadone-treated women as part of clinical supervision in working jointly with specialist drug workers.

Source: CINAHL

Full Text: Available in fulltext at EBSCO Host


Author(s): O'Grady MJ, Hopewell J, White MJ

Citation: Archives of Disease in Childhood -- Fetal & Neonatal Edition, 01 July 2009, vol./is. 94/4(0-), 13592998

Publication Date: 01 July 2009

Abstract: AIM: To ascertain the present management of neonatal abstinence syndrome (NAS) in neonatal units in the United Kingdom (UK) and Ireland. METHODS: Postal questionnaire to 235 neonatal units, with telephone follow-up of non-respondents. RESULTS: The response rate was 90%, and 96% of respondents had a formal NAS guideline. The median number of infants treated annually for NAS was 6 (range 1-100). The method of Finnegan was the most widely used scoring system (52%). Morphine sulphate was the most commonly used first line agent for both opiate (92%) and polysubstance (69%) withdrawal. Dosing regimens varied widely. Units using a maximum daily morphine dose of <400 microg/kg/day were more likely to require the addition of a second agent (76% vs 58%, p = 0.027). Phenobarbitone was the drug of choice to treat seizures secondary to both opiate and polydrug withdrawal in 73% and 81% of units, respectively. 29% of units allowed infants to be discharged home on medication. 58% of these allowed administration of opiates in the community and in almost half of cases this was managed by a parent. Mothers on methadone whose serology was positive for hepatitis B and/or C were four times more likely to be discouraged from breastfeeding. CONCLUSIONS: The majority of units currently use an opiate as the drug of first choice as recommended. Doses utilised and second agents added vary significantly between units. Many of our findings reflect the lack of high-quality randomised studies regarding management of NAS.

Source: CINAHL

Full Text: Available in fulltext at EBSCO Host

99. Clonidine as an adjunct therapy to opioids for neonatal abstinence syndrome: a randomized, controlled trial.

Author(s): Agthe AG, Kim GR, Mathias KB, Hendrix CW, Chavez-Valdez R, Jansson L, Lewis TR, Yaster M, Gauda EB

Citation: Pediatrics, 01 May 2009, vol./is. 123/5(0-), 00314005

Publication Date: 01 May 2009

Abstract: OBJECTIVE: To determine if oral clonidine would reduce the duration of opioid detoxification for neonatal abstinence syndrome. METHODS: Infants with intrauterine exposure to methadone or heroin and neonatal abstinence syndrome (2 consecutive

Full Text: Available in fulltext at Highwire Press
Modified Finnegan scores of > or =9) were enrolled at 2 hospitals during 2002-2005 and followed until final hospital discharge. All enrolled infants (80) received oral diluted tincture of opium according to a standardized algorithm and were randomly assigned to receive oral clonidine (1 microg/kg every 4 hours) (40 infants) or placebo (40 infants). Primary outcome was duration of opioid therapy. Secondary outcomes included the amount of opium required to control symptoms, number of treatment failures, and differences in blood pressure, heart rate, and oxygen saturation. RESULTS: The median length of therapy was 27% shorter in the clonidine group (11 [95% confidence interval: 8-15 days]) than in the placebo group (15 days [95% confidence interval: 12-17 days]). In the clonidine group, 7 infants required restarting opium after initial discontinuation versus none in the placebo group, with the total length of treatment/observation remaining significantly less in the clonidine group. Higher dosages of opium were required by 40% of the infants in the placebo group versus 20% in the clonidine group. Treatment failures occurred in 12.5% of the infants in the placebo group versus none in the clonidine group. Hypertension, hypotension, bradycardia, or desaturations did not occur in either group. Three infants in the clonidine group died as a result of myocarditis, sudden infant death syndrome, and homicide, all after hospital discharge and before 6 months of age. CONCLUSIONS: In this randomized, double-blind trial, adding clonidine to standard opioid therapy for detoxification from in utero exposure to methadone or heroin reduced the duration of pharmacotherapy for neonatal abstinence without causing short-term adverse cardiovascular outcomes. A larger trial is indicated to determine long-term safety.

Source: CINAHL

Full Text:
Available in fulltext at American Academy of Pediatrics
Available in fulltext at Highwire Press


Author(s): Dryden C, Young D, Hepburn M, Mactier H

Citation: BJOG: An International Journal of Obstetrics & Gynaecology, 01 April 2009, vol./is. 116/5(665-671), 14700328
Publication Date: 01 April 2009
Source: CINAHL

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Note: Click Athens Log In to access this journal. Enter NHS Athens username and password if required

104. Increasing prevalence of neonatal withdrawal syndrome: population study of maternal factors and child protection involvement.


Citation: Pediatrics, 01 April 2009, vol./is. 123/4(0-), 00314005
Publication Date: 01 April 2009
Abstract: OBJECTIVES: Illicit drug use during pregnancy is an important public health issue, with adverse effects on the newborn and implications for subsequent parenting. The aim of this study was to measure the birth prevalence of neonatal withdrawal syndrome over time, associated maternal characteristics and child protection involvement. METHODS: This is a retrospective cohort study that used linked health and child protection databases for all live births in Western Australia from 1980 to 2005. Maternal characteristics and mental health-and assault-related medical history were assessed by using logistic regression models. RESULTS: The birth prevalence of neonatal withdrawal syndrome increased from 0.97 to a high of 42.2 per 10 000 live births, plateauing after 2002. Mothers with a previous mental health admission, low skill level, Aboriginal status or who smoked during pregnancy were significantly more likely to have an infant with neonatal withdrawal syndrome. These infants were at greater risk for having a substantiated child maltreatment allegation and entering foster care. Increased risk for maltreatment was associated with mothers who were aged <30 years, were from socially disadvantaged backgrounds, Aboriginal status, and had a mental health-or assault-related admission. CONCLUSIONS: There has been a marked increase in neonatal withdrawal syndrome in the past 25 years. Specific maternal characteristics identified should facilitate planning for early identification and intervention for these women. Findings demonstrate an important
Pathway into child maltreatment and highlight the need for well-supported programs for women who use illicit drugs during pregnancy as well as the need for sustained long-term support after birth.

Source: CINAHL

Full Text:
Available in fulltext at American Academy of Pediatrics
Available in fulltext at Highwire Press

Author(s): D’Apolito K
Citation: Newborn & Infant Nursing Reviews, 01 March 2009, vol./is. 9/1(62-69), 15273369
Publication Date: 01 March 2009
Abstract: It is estimated that 5.2% of four million women in the United States abuse illicit drugs during pregnancy. As a result, approximately 208,000 newborn infants will be born to these drugs in utero. Of those infants who are exposed to opiates in utero, approximately 50% to 90% of them will have neonatal opiate withdrawal. A number of drugs have been used to treat neonatal abstinence; however, it is unclear what treatment is best. This article will describe the signs and symptoms of opiate withdrawal in the neonate, the clinical assessment tools that can be used to observe for neonatal withdrawal, and the possible treatment regimens used to treat neonatal abstinence. Copyright © 2009 Elsevier Inc. All rights reserved.
Source: CINAHL

111. High-dose methadone in pregnant women and its effect on duration of neonatal abstinence syndrome.
Author(s): Lim S, Prasad MR, Samuels P, Gardner DK, Cordero L
Citation: American Journal of Obstetrics & Gynecology, 01 January 2009, vol./is. 200/1(0-163), 00029378
Publication Date: 01 January 2009
Abstract: OBJECTIVE: The purpose of this study was to examine high-dose methadone in pregnant women and its effect on the duration of neonatal abstinence syndrome. STUDY DESIGN: This was a retrospective chart review of 68 neonates and their mothers who received methadone therapy during pregnancy. The last dosage of maternal methadone just before delivery and the length of treatment for neonatal abstinence syndrome were examined with an analysis of variance model. RESULTS: When the data were analyzed for methadone dosages as a continuous variable, each 1-mg increase in the last maternal methadone dosage before delivery was associated with an additional 0.18 days of infant treatment for neonatal abstinence syndrome (P < .001; 95% CI, 0.112-0.255). In other words, every increase of 5.5 mg of methadone in the mother was associated statistically with 1 additional day of neonatal abstinence syndrome treatment for the infant. Gestational age at delivery and birthweight were not statistically significant. CONCLUSION: Higher doses of maternal methadone were associated with an increase in diagnosis and longer duration of neonatal abstinence syndrome.
Source: CINAHL

Author(s): Pritham UA
Citation: , 01 January 2009, vol./is. /(0-163),
Publication Date: 01 January 2009
Abstract: Opioid dependency in pregnancy has been linked to physical, mental, and psychological problems for the pregnant women and their offspring. To lower health risks, pregnant women who are opioid dependent have been treated with methadone maintenance treatment (MMT), the standard of care since the early 1970s. In 2002, another treatment option became available when the United States (U.S.) Food and Drug Administration (FDA) approved the use of buprenorphine maintenance therapy (BMT) as a treatment for opioid dependence (Rayburn & Bogenschutz, 2004). The effect of these two synthetic opioid replacement therapies in pregnancy on perinatal and neonatal outcomes, particularly neonatal abstinence syndrome (NAS), continues to be controversial and further research is needed (Winklbaur, Jung, & Fischer, 2008). NAS occurs in 50-90% of neonates exposed in utero to opioids (Levinson-Castel, Merlob, Linder, Siroto, & Klinger, 2006) with a 60% likelihood of requiring pharmacotherapy and an extended hospital stay. Prolonged hospitalization of neonates with NAS impacts newborn attachment and increases health
118. Neonatal outcome following buprenorphine maintenance for opiate dependency.

Author(s): Fagan J, Keenan E
Citation: Irish Journal of Psychological Medicine, 01 December 2008, vol./is. 25/4(141-144), 07909667
Publication Date: 01 December 2008
Abstract: Methadone substitution improves maternal and neonatal outcomes. However methadone induced neonatal abstinence syndrome (NAS) is common. Buprenorphine exposed neonates may be at a lower risk of NAS. Currently in the Republic of Ireland, buprenorphine does not have a special licence for use in pregnancy. We describe here the history and neonatal outcomes of the first Irish woman maintained on buprenorphine during two pregnancies. Supervised urinanalysis on this mother between and throughout both pregnancies did not reveal any illicit drug use. She delivered two post-term babies of normal birth weight and length. The second infant required treatment for NAS for 21 days with morphine sulphate. Although the use of buprenorphine in pregnancy does not remove the possibility of NAS, neonatal outcomes of buprenorphine maintained women compares favourably to methadone. As the use of buprenorphine becomes more established in Ireland, the management of buprenorphine-exposed neonates will become more common.
Source: CINAHL

121. Predicting length of treatment for neonatal abstinence syndrome in methadone-exposed neonates.

Author(s): Seligman NS, Salva N, Hayes EJ, Dysart KC, Pequignot EC, Baxter JK
Citation: American Journal of Obstetrics & Gynecology, 01 October 2008, vol./is. 199/4(0-), 00029378
Publication Date: 01 October 2008
Abstract: OBJECTIVE: The objective of the study was to identify maternal variables predicting length of treatment for neonatal abstinence syndrome (NAS). STUDY DESIGN: This was a retrospective cohort study of infants treated for NAS during 2000-2006 whose mothers were on methadone maintenance at delivery. Mixed-effects linear regression was used to examine the interaction of maternal and neonatal variables with length of treatment. RESULTS: Of 204 neonates born to methadone exposed mothers, the average dose at delivery was 127 mg daily (25-340 mg) with median length of treatment 32 days (1-122 days). Trimester of initial exposure (P = .33), methadone dose at delivery (P = .198), body mass index (P = .31), antidepressant use (P = .40), cigarette use (P = .76), race (P = .78), and maternal age (P = .84) did not predict length of treatment. In the multivariate analysis, gestational age at delivery and benzodiazepine use were significant predictors of length of treatment. CONCLUSION: Later gestational age and concomitant benzodiazepine use were associated with longer treatment.
Source: CINAHL

125. Treating pregnant women dependent on opioids is not the same as treating pregnancy and opioid dependence: a knowledge synthesis for better treatment for women and neonates.

Author(s): Winklbaur B, Kopf N, Ebner N, Jung E, Thau K, Fischer G
Citation: Addiction, 01 September 2008, vol./is. 103/9(1429-1440), 09652140
Publication Date: 01 September 2008
Abstract: AIMS: Through a novel synthesis of the literature and our own clinical experience, we have derived a set of evidence-based recommendations for consideration as guidance in the management of opioid-dependent pregnant women and infants. METHODS: PubMed literature searches were carried out to identify recent key publications in the areas of pregnancy and opioid dependence, neonatal abstinence syndrome (NAS) prevention and treatment, multiple substance abuse and psychiatric comorbidity. RESULTS: Pregnant women dependent on opioids require careful treatment to minimize harm to the fetus and neonate and improve maternal health. Applying multi-disciplinary treatment as early as possible, allowing medication maintenance and regular monitoring, benefits mother and child both in the short and the long term. However, there is a need for randomized clinical trials with sufficient sample sizes. RECOMMENDATIONS: Opioid maintenance therapy is the recommended treatment approach during pregnancy. Treatment decisions must
encompass the full clinical picture, with respect to frequent complications arising from psychiatric comorbidities and the concomitant consumption of other drugs. In addition to standardized approaches to pregnancy, equivalent attention must be given to the treatment of NAS, which occurs frequently after opioid medication. CONCLUSION: Methodological flaws and inconsistencies confound interpretation of today's literature. Based on this synthesis of available evidence and our clinical experience, we propose recommendations for further discussion.

Source: CINAHL
Full Text: Available in fulltext at EBSCO Host

127. Sublingual buprenorphine for treatment of neonatal abstinence syndrome: a randomized trial.
Author(s): Kraft WK, Gibson E, Dysart K, Damle VS, LaRusso JL, Greenspan JS, Moody DE, Kaltenbach K, Ehrlich ME
Citation: Pediatrics, 01 September 2008, vol./is. 122/3(0-), 00314005
Publication Date: 01 September 2008
Abstract: OBJECTIVE. In utero exposure to drugs of abuse can lead to neonatal abstinence syndrome, a condition that is associated with prolonged hospitalization. Buprenorphine is a partial mu-opioid agonist used for treatment of adult detoxification and maintenance but has never been administered to neonates with opioid abstinence syndrome. The primary objective of this study was to demonstrate the feasibility and, to the extent possible in this size of study, the safety of sublingual buprenorphine in the treatment of neonatal abstinence syndrome. Secondary goals were to evaluate efficacy relative to standard therapy and to characterize buprenorphine pharmacokinetics when sublingually administered. METHODS. We conducted a randomized, open-label, active-control study of sublingual buprenorphine for the treatment of opiate withdrawal. Thirteen term infants were allocated to receive sublingual buprenorphine 13.2 to 39.0 μg/kg per day administered in 3 divided doses and 13 to receive standard-of-care oral neonatal opioid solution. Dose decisions were made by using a modified Finnegan scoring system. RESULTS. Sublingual buprenorphine was largely effective in controlling neonatal abstinence syndrome. Greater than 98% of plasma concentrations ranged from undetectable to approximately 0.60 ng/mL, which is less than needed to control abstinence symptoms in adults. The ratio of buprenorphine to norbuprenorphine was larger than that seen in adults, suggesting a relative impairment of N-dealkylation. Three infants who received buprenorphine and 1 infant who received standard of care reached protocol-specified maximum doses and required adjuvant therapy with phenobarbital. The mean length of treatment for those in the neonatal-opium-solution group was 32 compared with 22 days for the buprenorphine group. The mean length of stay for the neonatal-opium-solution group was 38 days compared with 27 days for those in the buprenorphine group. Treatment with buprenorphine was well tolerated. CONCLUSIONS. Buprenorphine administered via the sublingual route is feasible and apparently safe and may represent a novel treatment for neonatal abstinence syndrome.
Source: CINAHL
Full Text: Available in fulltext at American Academy of Pediatrics
Available in fulltext at Highwire Press
Available in print at Lincoln County Hospital Professional Library

Author(s): Kakko J, Heilig M, Sarman I
Citation: Drug & Alcohol Dependence, 01 July 2008, vol./is. 96/1-2(69-78), 03768716
Publication Date: 01 July 2008
Abstract: AIM: To compare the effects of fetal buprenorphine and methadone exposure during maintenance treatment of pregnant heroin dependent subjects. DESIGN AND SETTING: A population based comparison of consecutive, prospectively followed buprenorphine-exposed pregnancies in Stockholm County, Sweden, to retrospectively analyzed consecutive methadone-exposed pregnancies. PARTICIPANTS: All 47 pregnancies in 39 women with opiate dependence and buprenorphine maintenance treatment 2001-2006, and all 35 methadone-exposed pregnancies (26 women) 1982-2006 in Stockholm County. MEASUREMENTS: Intrauterine growth, birth outcome,
malformations, neonatal adaptation, withdrawal syndrome and infant mortality. FINDINGS: Buprenorphine-exposed pregnancies resulted in 47 uneventful live births (2 twin pairs), 1 stillbirth (for which no explanation was found) and 1 miscarriage. The birth weight of the infants was normal. Neonatal abstinence syndrome (NAS) occurred in 19 cases (40.4%), the majority mild in nature and only 7 (14.9%) needing withdrawal treatment. Compared to 35 infants born after intrauterine methadone exposure at the same hospital since 1982 (77.8% of them exhibiting NAS and 52.8% needing withdrawal treatment), there were significant advantages with buprenorphine treatment: birth weight was higher, due to longer gestation. Incidence of NAS of any intensity, as well as incidence of NAS that required pharmacological treatment was lower, while length of hospital stay was shorter. When buprenorphine treatment started pre-conception, NAS at any level was significantly less frequent than in subjects with post-conception initiated treatment (7/27, 26%; 12/20, 60%, respectively). CONCLUSIONS: Data from this non-randomized comparison suggest that buprenorphine may offer advantages for treatment of opiate dependence during pregnancy.

130. Applying education to practice: neonatal abstinence syndrome.
Author(s): Kusak K
Citation: Pulse (00334189), 01 July 2008, vol./is. 45/3(16-16), 00334189
Publication Date: 01 July 2008
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host

140. Neonatal abstinence syndrome.
Author(s): Lall A
Citation: British Journal of Midwifery, 01 April 2008, vol./is. 16/4(220-223), 09694900
Publication Date: 01 April 2008
Abstract: Neonatal abstinence syndrome (NAS) is the withdrawal response that occurs when an infant is exposed in utero to maternal drugs of addiction. NAS is characterized by irritability, tremors, hypertonicity, tachypnoea, vomiting and diarrhoea. Although NAS is more typically seen in opiate withdrawal, similar symptoms are seen when withdrawing from benzodiazepines, barbiturates and alcohol. The incidence of NAS has been reported as 54%DS94% of all babies who have been exposed to opiates in utero. Although there are few controlled trials in drug therapy of the infant with NAS, opiates have been proven to be effective in the management of infants with NAS following withdrawal from methadone or other opioid agents. Drug exposure in utero has been shown to reduce the birth weight and head circumference of the affected infant. There are also long-term cognitive and behavioural problems in infants with NAS, making follow-up essential.

159. Rooming-in compared with standard care for newborns of mothers uswing methadone or heroin.
Author(s): Abrahams RR, Kelly SA, Payne S, Thiessen PN, Mackintosh J, Janssen PA
Citation: Canadian Family Physician, 01 October 2007, vol./is. 53/(1723-1730), 0008350X
Publication Date: 01 October 2007
Abstract: OBJECTIVE: To evaluate the effect of rooming-in (rather than standard nursery care) on the incidence and severity of neonatal abstinence syndrome among opioid-exposed newborns and on the proportion of mothers who retain custody of their babies at hospital discharge. DESIGN: Retrospective cohort study. SETTING: Lower mainland in southwestern British Columbia. PARTICIPANTS: We selected 32 women in the city of Vancouver known to have used heroin or methadone during pregnancy between October 2001 and December 2002. Comparison groups were a historical cohort of 38 women in Vancouver and a concurrent cohort of 36 women cared for in a neighbouring community hospital. MAIN OUTCOME MEASURES: Need for treatment with morphine, number of days of treatment with morphine, and whether babies were discharged in the custody of their mothers. RESULTS: Rooming-in was associated with a significant decrease in need for treatment of neonatal abstinence syndrome compared with the historical cohort (adjusted relative risk [RR] 0.40, 95% confidence interval [CI] 0.20 to 0.78) and the
concurrent cohort (adjusted RR 0.39, 95% CI 0.20 to 0.75). Rooming-in was also associated with shorter newborn length of stay in hospital compared with both comparison groups. Newborns who roomed in at BC Women's Hospital were significantly more likely to be discharged in the custody of their mothers than babies in the historical cohort (RR 2.23, 95% CI 1.43 to 3.98) or the concurrent cohort (RR 1.52, 95% CI 1.15 to 2.53) were.

CONCLUSION: Rooming-in might ease opioid-exposed newborns' transition to extrauterine life and promote more effective mothering.

Source: CINAHL
Full Text:
Available in fulltext at Highwire Press
Available in fulltext at National Library of Medicine

163. Neonatal abstinence syndrome and cerebral infarction following maternal codeine use during pregnancy.
Author(s): Reynolds EW, Riel-Romero RMS, Bada HS
Citation: Clinical Pediatrics, 01 September 2007, vol./is. 46/7(639-645), 00099228
Publication Date: 01 September 2007
Abstract: Neonatal withdrawal from maternal drugs and medications is common in some NICUs. Codeine-containing cough preparations given to pregnant mothers have been identified as a cause of neonatal abstinence syndrome. However, many women do not consider prescription cough syrups when asked about drug use. Maternal medication or illicit drug use has been identified as a cause of perinatal arterial stroke. Since codeine is an opiate with similar pharmacodynamic effects to morphine, it is reasonable to investigate if maternal codeine use has effects on the fetus that are similar to other opiates. The authors present 2 cases of newborn infants with perinatal arterial stroke that may have been associated with in utero exposure to codeine. Physicians should ask about maternal medication use, including codeine-containing cough preparations, when evaluating newborn infants with evidence of cerebral infarction.
Source: CINAHL
Full Text:
Available in fulltext at EBSCO Host

168. Neonatal withdrawal syndrome following in utero exposure to paroxetine, clonazepam and olanzapine.
Author(s): Murray KL, Miller KM, Pearson DL
Citation: Journal of Perinatology, 01 August 2007, vol./is. 27/8(517-518), 07438346
Publication Date: 01 August 2007
Abstract: We describe a full-term infant with failed respiratory effort and decerebrate posturing following in utero exposure to paroxetine. All signs and symptoms associated with the paroxetine exposure were resolved by the second day of life. Upon discharge, the infant revealed a normal neurodevelopmental examination. Journal of Perinatology (2007) 27, 517-518; doi:10.1038/sj.jp.7211772.
Source: CINAHL

170. Sequela of preterm versus term infants born to mothers on a methadone maintenance program: differential course of neonatal abstinence syndrome.
Author(s): Dysart K, Hsieh HC, Kaltenbach K, Greenspan JS
Citation: Journal of Perinatal Medicine, 01 July 2007, vol./is. 35/4(344-346), 03005577
Publication Date: 01 July 2007
Abstract: Objective: We determined the effect of preterm delivery on the course of neonatal abstinence syndrome (NAS) in infants born to mothers participating in a methadone maintenance program. Study design: A retrospective cohort study was conducted in which infant and maternal data were collected from the medical records of 53 preterm and 66 term infants. Infants were selected from all infants admitted to Thomas Jefferson University hospital born between 1998 and 2002 whose mothers were enrolled in the methadone maintenance program. All infants were managed by a standard protocol utilizing the Neonatal Abstinence Scoring System (NASS) and neonatal opiate solution (NOS). Preterm and term infants were compared. Results: Preterm infants had shorter lengths of stay, treatment courses and required less medication than did term infants during the same time period. Conclusion: These data indicate that following exposure to maternal methadone, preterm infants have a different neonatal course than do infants born at term.
Source: CINAHL
Full Text:


Citation: Drug & Alcohol Dependence, 16 March 2007, vol./is. 87/2-3(131-138), 03768716

Publication Date: 16 March 2007

Abstract: Neonates born to opioid-maintained mothers are at risk of developing neonatal abstinence syndrome (NAS), which often requires pharmacological treatment. This study examined the effect of opioid maintenance treatment on the incidence and timing of NAS, and compared two different NAS treatments (phenobarbital versus morphine hydrochloride). Fifty-three neonates born to opioid-maintained mothers were included in this study. The mothers received methadone (n=22), slow-release oral morphine (n=17) or buprenorphine (n=14) throughout pregnancy. Irrespective of maintenance treatment, all neonates showed APGAR scores comparable to infants of non-opioid dependent mothers. No difference was found between the three maintenance groups regarding neonatal weight, length or head circumference. Sixty percent (n=32) of neonates required treatment for NAS [68% in the methadone-maintained group (n=15), 82% in the morphine-maintained group (n=14), and 21% in the buprenorphine-maintained group (n=3)]. The mean duration from birth to requirement of NAS treatment was 33h for the morphine-maintained group, 34h for the buprenorphine-maintained group and 58h for the methadone-maintained group. In neonates requiring NAS treatment, those receiving morphine required a significantly shorter mean duration of treatment (9.9 days) versus those treated with phenobarbital (17.7 days). Results suggest that morphine hydrochloride is preferable for neonates suffering NAS due to opioid withdrawal.

Source: CINAHL

179. Methadone-exposed newborn infants: outcome after alterations to a service for mothers and infants.

Author(s): Miles J, Sugumar K, Macrory F, Sims DG, D'Souza SWD

Citation: Child: Care, Health & Development, 01 March 2007, vol./is. 33/2(206-206), 03051862

Publication Date: 01 March 2007

Source: CINAHL

Full Text: Available in fulltext at EBSCO Host

184. Management of the newborn infant affected by maternal opiates and other drugs of dependency.

Author(s): Oei J, Lui K

Citation: Journal of Paediatrics & Child Health, 01 January 2007, vol./is. 43/1-2(9-18), 10344810

Publication Date: 01 January 2007

Source: CINAHL

Full Text: Available in fulltext at EBSCO Host

185. Neonatal abstinence syndrome: reconstructing the evidence.

Author(s): Marcellus L

Citation: Neonatal Network, 01 January 2007, vol./is. 26/1(33-40), 07300832

Publication Date: 01 January 2007

Abstract: Neonatal abstinence syndrome (NAS) is the term used to describe the presence of withdrawal symptoms in neonates exposed prenatally to opiates. Much of what is known about NAS is based on the biomedical model of illness. There is less consideration of the social, historical, and political influences on knowledge development about the NAS phenomenon. Social construction presents an alternate framework within which to consider the diagnosis of NAS and on which to strengthen theoretical foundations, expand research programs, and improve practice.

Source: CINAHL

Full Text: Available in fulltext at EBSCO Host

Available in print at Lincoln County Hospital Professional Library
189. What is the best evidence based management of neonatal abstinence syndrome?
Author(s): Nandakumar N, Sankar VS
Citation: Archives of Disease in Childhood -- Fetal & Neonatal Edition, 01 November 2006,
vol./is. 91/6(0-0), 13592998
Publication Date: 01 November 2006
Source: CINAHL
Full Text:
Available in fulltext at Highwire Press
Available in fulltext at National Library of Medicine

194. Neonatal abstinence syndrome secondary to in-utero caffeine exposure.
Author(s): Hoffman DJ, Brown GD
Citation: Neonatal Intensive Care, 01 October 2006, vol./is. 19/6(24-25), 10622454
Publication Date: 01 October 2006
Abstract: The neonatal abstinence syndrome (NAS) is a common problem encountered by infants born to mothers addicted to narcotics. This entity is usually not considered in infants delivered from mothers who use non-narcotic or non-prescription substances. Alcohol, tobacco, cannabinoid, heroin and cocaine are the drugs of abuse that are most commonly encountered in the United States. The expression of NAS is variable and depends on the drugs involved, maternal usage patterns, infant age and the specific drug's metabolism. Drug exposure is often unrecognized. Symptoms may appear shortly after birth or become apparent during the neonatal period. Drug withdrawal from prescribed maternal medications such as selective serotonin re-uptake inhibitors is regular occurrence. Although caffeinated beverages are discouraged during pregnancy, infants may experience symptoms of withdrawal following birth related to this exposure. Caffeine, however, is often not considered when neonatal signs of abstinence become apparent. We report a neonate who manifested signs and symptoms of withdrawal believed to be related to the ingestion of large amounts of caffeine-containing substances by the mother.
Source: CINAHL

Author(s): Wunsch MJ
Citation: Journal of Addictive Diseases, 01 September 2006, vol./is. 25/3(27-33), 10550887
Publication Date: 01 September 2006
Abstract: Neonatal opioid withdrawal often requires treatment but there have been few recent studies of current pharmacological interventions to guide treatment. This retrospective chart review provides an exploratory examination of newborns treated with either methadone or paregoric for opioid withdrawal and outlines dosage ranges and intervals, side effects, and clinical outcomes of the two regimens. The outcome variables examined were time to resolution of withdrawal symptoms, rate of decrease in symptom severity, and length of hospital stay. There were no observed differences in outcome variables between the two treatment groups and side effect profiles were similar. Dosages, dosage intervals, and tapering regimens were consistent with American Academy of Pediatrics recommendations. Although the sample size is small and standardized regimens were not used, this study provides preliminary data about dosing levels and dosing intervals of these two pharmacologic treatment agents. Both groups of infants had favorable outcomes, although given the variation in treatment regimens it is difficult to draw an equation of equivalency. These results are applicable to the design of future studies of pharmacological interventions.
Source: CINAHL
Full Text:
Available in fulltext at EBSCO Host

210. SSRIs and neonatal abstinence syndrome.
Citation: Nurses' Drug Alert, 01 April 2006, vol./is. 30/4(20-21), 01912291
Publication Date: 01 April 2006
Source: CINAHL

Author(s): Fischer G, Ortner R, Rohrmeister K, Jagsch R, Baewert A, Langer M, Aschauer H
Citation: Addiction, 01 February 2006, vol./is. 101/2(275-281), 09652140
Publication Date: 01 February 2006
Abstract: Aims To evaluate the efficacy and safety of methadone versus buprenorphine treatment in pregnant opioid-dependent women. Design Randomized, double-dummy, double-blind, flexible-dosing comparison study. Setting Addiction Clinic at the Medical University of Vienna, Austria. Participants Eighteen women were assigned randomly to receive either methadone (n = 9) or buprenorphine (n = 9) during weeks 24-29 of pregnancy. After dropouts, data were available from 14 cases (six in the methadone and eight in the buprenorphine group). Intervention Sublingual buprenorphine tablets (8-24 mg/day) or oral methadone solution (40-100 mg/day), with matched placebos.
Measurements Mothers: retention in treatment, urine toxicology and nicotine use. Neonates: Routine birth data, neonatal abstinence syndrome (NAS) in severity and duration. Findings There was somewhat greater retention in the buprenorphine group but significantly lowered use of additional opioids in the methadone group (P = 0.047). Neonates: There was earlier onset of NAS in neonates born to the methadone (mean 60 hours) than to the buprenorphine groups (mean 72 hours after last medication); 43% did not require NAS-treatment with short treatment duration in both groups (mean 5 days). Conclusion This preliminary study had limited power to detect differences but the trends observed suggest this kind of research is practicable and that further studies are warranted.
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host

215. Neonatal abstinence syndrome after in utero exposure to selective serotonin reuptake inhibitors in term infants.
Author(s): Levinson-Castiel R, Merlob P, Linder N, Sirota L, Klinger G
Citation: Archives of Pediatrics & Adolescent Medicine, 01 February 2006, vol./is. 160/2(173-176), 10724710
Publication Date: 01 February 2006
Source: CINAHL
Full Text: Available in fulltext at Highwire Press

Author(s): Sarkar S, Donn SM
Citation: Journal of Perinatology, 01 January 2006, vol./is. 26/1(15-17), 07438346
Publication Date: 01 January 2006
Abstract: Aims:To determine the monitoring and treatment of neonatal abstinence syndrome (NAS) in neonatal intensive care units (NICUs) following opiate or polydrug exposure in utero. Methods: A pretested questionnaire was distributed via email to the chiefs of the neonatology divisions with accredited Fellowship programs in Neonatal-Perinatal Medicine in the United States. Results: Of the 102 individuals contacted, 75 participated in the survey. In all, 41 of the respondents (54.5%) have a written policy regarding the management of neonatal NAS. The method of Finnegan is the most commonly used abstinence scoring system (49 of 75, 65%), while only three respondents use the Lipsitz tool. Opioids (tincture of opium, or morphine sulfate solution) are used most commonly for management of both opioid (63% of respondents) and polydrug (52% of respondents) withdrawal, followed by phenobarbital (32% of respondents) for polydrug withdrawal and methadone (20% of respondents) for opioid withdrawal. In all, 53 respondents (70%) use phenobarbital, and 19 (25%) use intravenous morphine to control opioid withdrawal seizures, while 61 (81%) use phenobarbital in cases of polydrug withdrawal seizures. Only 53 respondents (70%) always use an abstinence scoring system to determine when to start, titrate, or terminate pharmacologic treatment of neonatal NAS. Conclusion: The management of neonatal psychomotor behavior consistent with withdrawal varies widely, with inconsistent policies to determine its presence or treatment. Only about half of NICUs have written guidelines for the management of NAS, which may preclude effective auditing of this practice. Educational interventions may be necessary to ensure changes in clinical practice.
Journal of Perinatology (2006) 26, 15-17. doi:10.1038/sj.jp.7211427; published online 24 November 2005
231. A retrospective study of length of hospital stay in infants treated for neonatal abstinence syndrome with methadone versus oral morphine preparations.

Author(s): Lainwala S, Brown ER, Weinschenk NP, Blackwell MT, Hagadorn JI

Citation: Advances in Neonatal Care (Elsevier Science), 01 October 2005, vol./is. 5/5(265-272), 15360903

Publication Date: 01 October 2005

Abstract: PURPOSE: Length of hospital stay (LOS) of infants treated for neonatal abstinence syndrome (NAS) with methadone was compared to LOS of those treated with an oral morphine preparation (OMP, neonatal morphine solution, or deodorized tincture of opium). METHODS: A retrospective review of medical records of infants treated for NAS due to in utero exposure to methadone and/or illicit drugs such as heroin or morphine was performed for birthweight, neonatal abstinence scores, infant and maternal illicit drug exposure history, maternal methadone dose (if any), and details of treatment. Length of stay was the primary outcome measure. RESULTS: Forty-six infants met the inclusion criteria. The median LOS of infants treated with methadone versus OMP was not significant (P > 0.05). Prolonged LOS was associated with larger pharmacological treatment doses required to control withdrawal symptoms, larger maternal methadone dose, and increased birthweight. After adjusting for these factors, exposure to opioids in utero, maternal nicotine use, hospital of treatment, severity of withdrawal symptoms, and foster care placement were not significantly associated with LOS in univariate or multivariate analyses. CONCLUSIONS: These results suggest that infants treated with OMP or methadone have similar LOS. Longer LOS is associated with both higher maternal methadone doses and higher opioid treatment dose requirements after birth. The potential effect of maternal methadone dose on neonatal LOS should be considered when treating expectant mothers on methadone maintenance therapy.

Source: CINAHL


Author(s): McCarthy JJ, Leamon MH, Parr MS, Anania B

Citation: American Journal of Obstetrics & Gynecology, 01 September 2005, vol./is. 193/3 Part 1(606-610), 00029378

Publication Date: 01 September 2005

Abstract: OBJECTIVE: This study assesses the effect of higher doses of methadone during pregnancy on maternal and fetal outcomes. STUDY DESIGN: We retrospectively reviewed clinical data for 81 mothers who received methadone and their 81 offspring. The cohort was divided into high-dose (/>=100 mg) and low-dose (<100 mg) groups. RESULTS: There were no differences in the rate of medication treatment for neonatal abstinence symptoms or days of infant hospitalization between the high-dose (mean, 132 mg) and low-dose (mean, 62 mg) groups. Despite longer histories of opiate abuse, the high-dose group had less illicit drug use at delivery. The whole cohort, which received an average of 101 mg/d, had an 81% rate of negative toxicology screens at delivery. CONCLUSION: High doses of methadone were not associated with increased risks of neonatal abstinence symptoms but had a positive effect on maternal drug abuse. Arbitrarily limiting methadone dose as a way of minimizing the risks of neonatal abstinence symptoms may be unwarranted.

Source: CINAHL

238. Buprenorphine versus methadone in the treatment of pregnant opioid-dependent patients: effects on the neonatal abstinence syndrome.

Author(s): Jones HE, Johnson RE, Jasinski DR, O'Grady KE, Chisholm CA, Choo RE, Crocetti M, Dudas R, Harrow C, Huestis MA, Jansson LM, Lantz M, Lester BM, Millo L

Citation: Drug & Alcohol Dependence, 01 July 2005, vol./is. 79/1(1-10), 03768716

Publication Date: 01 July 2005

Abstract: This study was designed to compare the neonatal abstinence syndrome (NAS) in neonates of methadone and buprenorphine maintained pregnant opioid-dependent women and to provide preliminary safety and efficacy data for a larger multi-center trial. This randomized, double-blind, double-dummy, flexible dosing, parallel-group controlled trial was conducted in a comprehensive drug-treatment facility that included residential and ambulatory care. Participants were opioid-dependent pregnant women and their neonates. Treatment involved daily administration of either sublingual buprenorphine or oral methadone using flexible dosing of 4-24 mg or 20-100 mg, respectively. Primary a priori outcome measures were: (1) number of neonates treated for NAS; (2) amount of opioid
agonist medication used to treat NAS; (3) length of neonatal hospitalization; and (4) peak NAS score. Two of 10 (20%) buprenorphine-exposed and 5 of 11 (45.5%) methadone-exposed neonates were treated for NAS (p=.23). Total amount of opioid-agonist medication administered to treat NAS in methadone-exposed neonates was three times greater than for buprenorphine-exposed neonates (93.1 versus 23.6; p=.13). Length of hospitalization was shorter for buprenorphine-exposed than for methadone-exposed neonates (p=.021). Peak NAS total scores did not significantly differ between groups (p=.25). Results suggest that buprenorphine is not inferior to methadone on outcome measures assessing NAS and maternal and neonatal safety when administered starting in the second trimester of pregnancy.

Source: CINAHL

Author(s): Bois-Byrne M, Wunsch M
Citation: Substance Abuse, 01 June 2005, vol./is. 26/2(63-64), 08897077
Publication Date: 01 June 2005
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host

247. Identification and management of neonatal abstinence syndrome.
Author(s): Beauman SS
Citation: Journal of Infusion Nursing, 01 May 2005, vol./is. 28/3(159-167), 15331458
Publication Date: 01 May 2005
Abstract: The nursing care of infants experiencing withdrawal from drug abuse through passive exposure is often challenging. These infants are at higher risk for many medical complications in addition to withdrawal itself. Often, infusion nurses play an important role in caring for an infant with drug withdrawal by providing infusion therapy for the infant's compromised medical condition, poor oral intake, and withdrawal symptoms. This article focuses on drug abuse during pregnancy, the withdrawal symptoms it may cause in the infant, ways to recognize an infant experiencing neonatal abstinence syndrome, and available scoring tools and treatment options.
Source: CINAHL

Citation: Nurses' Drug Alert, 01 April 2005, vol./is. 29/4(25-26), 01912291
Publication Date: 01 April 2005
Source: CINAHL

252. Selective serotonin reuptake inhibitors in pregnant women and neonatal withdrawal syndrome: a database analysis.
Author(s): Sanz EJ, De-las-Cuevas C, Kiuru A, Bate A, Edwards R
Citation: Lancet, 05 February 2005, vol./is. 365/9458(482-487), 00995355
Publication Date: 05 February 2005
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host
Available in fulltext at Elsevier
Available in print at Grantham Hospital Staff Library
Available in print at Lincoln County Hospital Professional Library
Available in print at Louth County Hospital Medical Library
Available in print at Pilgrim Hospital Staff Library

253. Therapy of the neonatal abstinence syndrome with tincture of opium or morphine drops.
Author(s): Langenfeld S, Birkenfeld L, Herkenrath P, Muller C, Hellmich M, Theisohn M
Citation: Drug & Alcohol Dependence, 07 January 2005, vol./is. 77/1(31-36), 03768716
Publication Date: 07 January 2005
Abstract: BACKGROUND: Treating opioid-addicted women with methadone in pregnancy increased the number of newborns suffering from neonatal abstinence syndrome (NAS). High-pitch crying, insomnia, tremor, myoclonic jerks, vomiting, diarrhoea and poor weight gain were reported symptoms, which were evaluated using the Finnegan (F)-score. Earlier
phenobarbital or paregoric had been used to suppress symptoms. We surveyed the administration of pure mu-agonist morphine (MO) in comparison to the alcoholic opioid mixture in tincture of opium (TO). Thirty-three newborns were included in the survey, after informed consent by their parents. RESULTS: NAS started 3-5 days after delivery and lasted for 27 or 30 days (mean) in the TO and MO groups, respectively. In either of the tested parameters, we found no significant differences between the two groups (2P < 0.05). The maximum F-score was similar in both groups, but the dose to suppress NAS was higher in the MO group (0.6-0.5 mg/day; total dose 61.6-42.7 mg of morphine). The duration of the therapy was longer in the MO than in the TO group (37.5-32.4 days). On the other hand the weight gain was better in the MO group than in the TO group (25-19 g/day), but was reduced in both groups compared with healthy newborns. CONCLUSIONS: Morphine is suitable to treat NAS in a similar manner as tincture of opium, but avoids unwanted effects of the alcoholic extracts with various alkaloids in the tincture of opium and allows better weight gain of the newborns. Source: CINAHL

15. Clonidine clearance matures rapidly during the early postnatal period: A population pharmacokinetic analysis in newborns with neonatal abstinence syndrome
Author(s): Xie H.-G., Cao Y.J., Gauda E.B., Agthe A.G., Hendrix C.W., Lee H.
Citation: Journal of Clinical Pharmacology, April 2011, vol./is. 51/4(502-511), 0091-2700;1552-4604 (April 2011)
Publication Date: April 2011
Abstract: The population pharmacokinetic (PK) profile of oral clonidine was characterized in newborns with neonatal abstinence syndrome, and significant covariates affecting its PK parameters were identified. Plasma clonidine concentration data were obtained from a clinical trial in which 36 newborns, aged 1 to 25 days (postnatal age, PNA) and weighing 2.1 to 3.9 kg, were enrolled to take multiple oral doses of clonidine. The population PK model of clonidine was developed by NONMEM, and significant covariates were identified, followed by nonparametric bootstraps (2000 replicates) and simulation experiments. A 1-compartment open linear PK model was chosen to describe plasma concentrations of clonidine, and body weight and PNA were significant covariates for apparent clearance (CL/F) as follows: CL/F (L/h) = 15.2 x [body weight (kg)/70]0.75 x [PNA (day)0.441/(4.060.441 + PNA (day)0.441)]. Furthermore, CL/F of clonidine increased rapidly with PNA during the first month of life after body weight was adjusted. Any optimal dosage regimen for clonidine in term neonates should be based on infant's age and body weight, and 1.5 mug/kg every 4 hours is proposed starting the second week of life based on the simulation results. 2011 The Author(s).
Source: EMBASE

17. Prenatal methadone exposure, meconium biomarker concentrations and neonatal abstinence syndrome
Citation: Addiction (Abingdon, England), December 2010, vol./is. 105/12(2151-2159), 1360-0443 (Dec 2010)
Publication Date: December 2010
Abstract: Methadone is standard pharmacotherapy for opioid-dependent pregnant women, yet the relationship between maternal methadone dose and neonatal abstinence syndrome (NAS) severity is still unclear. This research evaluated whether quantification of fetal methadone and drug exposure via meconium would reflect maternal dose and predict neonatal outcomes. Prospective clinical study. An urban drug treatment facility treating pregnant and post-partum women and their children. Forty-nine opioid-dependent pregnant women received 30-110 mg methadone daily. Maternal methadone dose, infant birth parameters and NAS assessments were extracted from medical records. Thrice-weekly urine specimens were screened for opioids and cocaine. Newborn meconium specimens were quantified for methadone, opioid, cocaine and tobacco biomarkers. There was no relationship between meconium methadone concentrations, presence of opioids, cocaine and/or tobacco in meconium, maternal methadone dose or NAS severity. Opioid and cocaine were also found in 36.7 and 38.8 of meconium specimens, respectively, and were associated with positive urine specimens in the third trimester. The presence of opioids other than methadone in meconium correlated with increased rates of preterm birth, longer infant hospital stays and decreased maternal time in drug treatment. Methadone and its
metabolite 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP) concentrations in meconium did not predict infant birth parameters or NAS severity. Prospective urine testing defined meconium drug detection windows for opiates and cocaine as 3 months, rather than the currently accepted 6 months. The presence of opioids in meconium could be used as a biomarker for infants at elevated risk in the newborn period. 2010 Society for the Study of Addiction. No claim to original US government works.

Source: EMBASE

20. Identifying infants at risk for neonatal abstinence syndrome: A retrospective cohort comparison study of 3 screening approaches

Author(s): Murphy-Oikonen J., Montelpare W.J., Southon S., Bertoldo L., Persichino N.
Citation: Journal of Perinatal and Neonatal Nursing, October 2010, vol./is. 24/4(366-372), 0893-2190 (October-December 2010)
Publication Date: October 2010
Abstract: OBJECTIVE:: The main objective of this study was to analyze the consistency in using a standardized newborn toxicology screening protocol to identify infants at risk of developing neonatal abstinence syndrome (NAS). DESIGN:: A retrospective cohort comparison design was approved by the institutional review board at the regional hospital and used to gather data from the infants’ medical records during the study period. SETTING:: The data were collected for a period of 1 year from a regional hospital serving 100 000 patients per annum. PATIENTS/PARTICIPANTS:: Data were based on expectant mothers who delivered between March 2006 and March 2007. METHOD:: Data of maternal self-reported substance use, and urine toxicology results and meconium results were obtained through retrospective chart review of infants exhibiting signs of NAS as noted by nurses on the Finnegan Scoring Tool. RESULTS:: In the absence of accurate prenatal screening, this study lends positively to support the use of toxicology screening protocols at birth to adequately assess and treat infants exposed to illicit substances. Toxicology screening is not intrusive and despite emotional discomfort experienced by mothers of the infants tested, the benefits of attaining accurate information regarding substance exposure is critical for the well-being of the infant. CONCLUSION:: The use of a toxicology screening protocol at birth appears beneficial in determining the need for identifying infants with NAS. Early detection of substance exposure in newborns leads to timely assessment for NAS and subsequent treatment to reduce symptoms in newborns. Copyright 2010 Wolters Kluwer Health | Lippincott Williams & Wilkins.

Source: EMBASE

23. Neonatal abstinence scores in opioid-exposed and nonexposed neonates: A blinded comparison

Author(s): Jones H.E., Harrow C., O’Grady K.E., Crocetti M., Jansson L.M., Kaltenbach K.
Citation: Journal of Opioid Management, November 2010, vol./is. 6/6(409-413), 1551-7489 (November-December 2010)
Publication Date: November 2010
Abstract: Twenty-nine opioid-exposed and 26 nonopioid-exposed neonates received neonatal abstinence syndrome (NAS) assessment by an examiner blinded to group status twice daily over the first two postnatal days. The opioid-exposed group had higher mean NAS scores than the nonopioid-exposed group. A 3-sign index, consisting of hyperactive moro reflex, mild tremors when undisturbed, and increased muscle tone, showed excellent discrimination between groups. The use of a 3-sign screening index in the days immediately after birth may provide a cost-effective mechanism for the identification of opioid-exposed infants, particularly in infants of women for whom identification of status as a substance user may not be immediately evident. Although a potentially useful screening tool, the 3-sign screening tool should not replace the full assessment of the opioid-exposed infant after birth. 2010 Journal of Opioid Management, All Rights Reserved.

Source: EMBASE

37. On categorizing gestational, birth, and neonatal complications following late pregnancy exposure to antidepressants: The prenatal antidepressant exposure syndrome

Author(s): Gentile S.
Citation: CNS Spectrums, March 2010, vol./is. 15/3(167-185), 1092-8529 (March 2010)
Publication Date: March 2010
Abstract: Introduction: Late in utero exposure to antidepressants has been suspected of adversely impacting pregnancy outcome and compromising neonatal adaptation. Hence,
the necessity exists to analyze published information on antidepressant use during late pregnancy to individuate potential recurrent patterns of iatrogenic complications. Methods: Computerized searches on MEDLINE, PsycINFO, EMBASE, and Cochrane Library through February 10, 2010 were performed for selecting literature information and investigating the safety of antidepressants when used during late pregnancy. Results: Antidepressant treatment during late pregnancy may increase the rates of poor pregnancy outcome and neonatal withdrawal/toxic reactions. Conclusions: Because both gestational complications and neonatal adverse events acknowledge the same etiology, the author suggests including such iatrogenic events under the definition of prenatal antidepressant exposure syndrome, in order to increase clinicians' awareness about the spectrum of risks which may concern the mother-infant pair when antidepressant treatment is deemed indispensable during late pregnancy.

Source: EMBASE
Full Text: Available in fulltext at EBSCO Host

48. Treatment of neonatal withdrawal with clonidine after long-term, high-dose maternal use of tramadol
Author(s): O'Mara K., Gal P., DaVanzo C.
Citation: Annals of Pharmacotherapy, July 2010, vol./is. 44/7-8(1342-1344), 1060-0280 (July-August 2010)
Publication Date: July 2010
Abstract: OBJECTIVE: To describe a case of tramadol withdrawal in a neonate and treatment with clonidine after exposure to long-term maternal use of high-dose tramadol.
CASE SUMMARY: A 34-week gestational age neonate displayed symptoms of tramadol withdrawal within 48 hours of delivery. Due to a confusing initial clinical picture, including presumed congenital Chlamydia, questionable seizures, and an original report of maternal use of ketorolac (Toradol), diagnosis was delayed until day of life 5. Symptoms included jitteriness, myoclonic movements, and irritability. Upon further questioning of the mother, it was revealed that she was actually taking tramadol 600-800 mg daily. The infant was placed on maintenance therapy with oral clonidine (from 1 to 3 mug/kg orally every 3 hours) until discontinuation on day of life 11. After 3 days off treatment, he began to display symptoms of withdrawal again. Clonidine was restarted at 1 mug/kg orally every 8 hours and he was discharged home on maintenance clonidine therapy at 18 days postnatal age. A 7-day tapering regimen was initiated 2 weeks after discharge, and no further withdrawal symptoms occurred. DISCUSSION: Few published articles are available to guide clinicians on the clinical course and treatment strategies for tramadol dependence and withdrawal. In neonates, the reports are particularly sparse. Traditional agents used in neonatal opioid withdrawal are narcotics (morphine, tincture of opium, methadone), benzodiazepines (diazepam, lorazepam), and phenobarbital. Clonidine use for neonatal abstinence syndrome from narcotics has been shown to be effective alone or in combination with agents such as other opiates and chloral hydrate. Potential benefits of clonidine therapy include shorter duration of therapy, reduced withdrawal symptoms, and decreased length of hospital stay. CONCLUSIONS: Withdrawal can be prolonged in infants exposed to maternal tramadol use. Clonidine may be a safe and effective option for managing symptoms of neonatal tramadol abstinence.
Source: EMBASE

65. Selective serotonin reuptake inhibitor induced neonatal abstinence syndrome
Author(s): Klinger G., Merlob P.
Citation: Israel Journal of Psychiatry and Related Sciences, 2008, vol./is. 45/2(107-113), 0333-7308 (2008)
Publication Date: 2008
Abstract: Depression is common in women of childbearing age and especially during pregnancy and the postpartum period. Selective serotonin reuptake inhibitors (SSRIs) are increasingly being used to treat depression prior to and throughout pregnancy. Up to 30% of the newborn infants exposed to SSRIs may present with clinical signs during the first days after birth. Neonatal abstinence syndrome (NAS) describes this clinical syndrome resulting from prior prolonged exposure to SSRI induced by cessation of the drug. NAS includes a wide spectrum from mild to severe non-specific symptoms which were categorized into four groups of effects: central nervous system (depression followed by excitation), gastrointestinal, autonomic and respiratory. A protocol for observation of SSRI-exposed newborns is presented including an objective method (Finnegan score) to monitor
onset, progression and improvement of NAS symptoms.
Source: EMBASE

79. Pharmacological aspects of neonatal antidepressant withdrawal
Citation: Obstetrical and Gynecological Survey, April 2008, vol./is. 63/4(267-279), 0029-7828 (Apr 2008)
Publication Date: April 2008
Abstract: Depression is common in reproductive age women, and continued pharmacologic treatment of depression during pregnancy may be necessary to prevent relapse, which could be harmful for both the fetus and the mother. Although data on drug safety are imperfect and incomplete, the benefits of antidepressant therapy during pregnancy generally outweigh the risks. Neonates who are exposed to antidepressant medications during gestation are at increased risk to have neonatal withdrawal syndrome, although the exact incidence of this complication is unknown because the definition of the syndrome is not clear and withdrawal reactions are probably underreported. Tricyclic antidepressant withdrawal syndrome is most likely related to muscarinergic activity and individual drug half-lives, and selective serotonin reuptake inhibitor withdrawal may be due to a decrease in available synaptic serotonin in the face of down-regulated serotonin receptors, the secondary effects of other neurotransmitters, and biological or cognitive sensitivity. Other factors that influence neonatal toxicity or withdrawal include the normal physiologic changes of pregnancy, the altered activity of CYP450 enzymes during pregnancy, drug-drug transporter (Pgp and OCT3) interaction, and the presence of genetic polymorphisms in genes influencing drug metabolism. Further research is necessary. TARGET AUDIENCE: Obstetricians & Gynecologists, Family Physicians LEARNING OBJECTIVES: After completion of this article, the reader should be able to explain the importance of antidepressant therapy during pregnancy and postpartum, summarize the important neonatal effects of antidepressants, and describe the potential teratogenic effects of antidepressants. 2008 Lippincott Williams & Wilkins, Inc.
Source: EMBASE

83. Treatment resistant hyperemesis gravidarum in a patient with type 1 diabetes mellitus: Neonatal withdrawal symptoms after successful antiemetic therapy with mirtazapine
Author(s): Schwarzer V., Heep A., Gembruch U., Rohde A.
Citation: Archives of Gynecology and Obstetrics, January 2008, vol./is. 277/1(67-69), 0932-0067 (Jan 2008)
Publication Date: January 2008
Abstract: Here we present the case of a 30-year-old woman with type I diabetes mellitus, preeclampsia and treatment resistant persistent hyperemesis gravidarum in her 25th week of gestation who was successfully treated with the antidepressant mirtazapine (Remergil). Nausea and vomiting resolved within 5 days. After discharge from the hospital in 28 weeks of gestation and discontinuation of the medication on her own initiative a relapse occurred, once again with good response to mirtazapine. The drug was continued until birth. At 34 + 0 weeks a cesarian section was performed due to fetal growth restriction and deteriorating preeclampsia. During the second and fourth day postnatal age the child temporarily developed hyperarousal which could be explained by mirtazapine withdrawal. 2007 Springer-Verlag.
Source: EMBASE
Full Text: Available in fulltext at EBSCO Host

92. Neonatal withdrawal syndrome after chronic maternal drinking of mate
Author(s): Martin I., Lopez-Vilchez M.A., Mur A., Garcia-Algar O., Rossi S., Marchei E., Pichini S.
Citation: Therapeutic Drug Monitoring, February 2007, vol./is. 29/1(127-129), 0163-4356 (Feb 2007)
Publication Date: February 2007
Abstract: The premature newborn of a mother who reported drinking mate during pregnancy presented with increased jitteriness and irritability, high-pitched cry, hypertonia in the limbs, and brisk tendon reflexes consistent with neonatal withdrawal syndrome. High concentrations of caffeine and theobromine were detected in various maternal and
neonatal biological matrices (placenta, cord serum, neonatal urine, maternal and neonatal hair, meconium, and breast milk), demonstrating both acute and chronic prenatal and postnatal exposure to these methylxanthines, contained in high amounts in homemade mate. Symptoms progressively disappeared at 84 hours of age, although intermittent irritability was still present when the infant was discharged at 24 days of age. Fluctuating caffeine (and theobromine) content in different breast milk feeds likely generated the baby’s irritability, due to either the physiological stimulatory effects of the methylxanthines or postnatal withdrawal syndrome as the substances cleared from the body. The mother was strongly advised to initiate a considerable, progressive, constant reduction of mate consumption to a maximum of 2 cups a day for the duration of breastfeeding. 2007
Lippincott Williams & Wilkins, Inc.
Source: EMBASE

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From 1st 50 results…

Neonatal abstinence syndrome
[PDF] from medind.nic.in
V Tiroumourougane Serane… - Indian journal of pediatrics, 2008 - Springer
Abstract Objective. To study the substance misuse in pregnant mothers and its impact on their newborns Methods. Case note review of the study population was undertaken. Infants of mothers who had taken substance of misuse were monitored regularly using ...
Cited by 9 - Related articles - Lancashire Teaching Hospitals - Find@The Christie - All 5 versions

[PDF] Neonatal abstinence syndrome
[PDF] from healthystartfv.org
Lancashire Teaching HospitalsA Lall - British Journal of Midwifery, 2008 - senfiles.healthystartfv.org
Abstract Neonatal abstinence syndrome (NAS) is the withdrawal response that occurs when an infant is exposed in utero to maternal drugs of addiction. NAS is characterized by irritability, tremors, hypertonicity, tachypnoea, vomiting and diarrhoea. Although NAS is ...
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Neonatal abstinence syndrome
S Walkinshaw, B Shaw… - Drug misuse and motherhood, 2002 - books.google.com
Opiate dependency carries many adverse effects in pregnancy, though many may be related to the confounding social variables (Siney et al., 1995). The one constant and specific problem of concern to pregnant women dependent on opiates or other drugs is that of ...
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Neonatal abstinence syndrome
[PDF] from yimg.com
AE Burgos… - NeoReviews, 2009 - Am Acad Pediatrics
Despite the growing knowledge of recognition, treatment, and outcomes, NAS continues to challenge clinicians. An increasing number of women receiving prescribed medications for chronic pain conditions and mental illness also have changed the population needing ...
Cited by 5 - Related articles - Lancashire Teaching Hospitals - Find@The Christie - All 2 versions

Opioid maintenance treatment during pregnancy: occurrence and severity of neonatal abstinence syndrome
PN abstinence syndrome Neonatal… - Eur Addict …, 2009 - content.karger.com
Abstract Background: Opioid maintenance treatment (OMT) is widely used to treat pregnant women with a history of opioid dependence. This study investigated whether maternal methadone/buprenorphine dose and nicotine use in pregnancy affects the occurrence ...
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Neonatal abstinence syndrome after in utero exposure to selective serotonin reuptake inhibitors in term infants
Management of neonatal abstinence syndrome in neonatal intensive care units: a national survey
Lancashire Teaching Hospitals, R Levinson-Castiel, P Merlob, N Linder… - Archives of Pediatrics …, 2006 - Am Med Assoc
Aims: To determine the monitoring and treatment of neonatal abstinence syndrome (NAS) in neonatal intensive care units (NICUs) following opiate or polydrug exposure in utero. Methods: A pretested questionnaire was distributed via email to the chiefs of the …
Cited by 121 - Related articles - The Christie Online Journals - BL Direct - All 9 versions

Effects of breast milk on the severity and outcome of neonatal abstinence syndrome among infants of drug-dependent mothers
The Christie Online Journals, ME Abdel-Latif, J Pinner, S Clews, F Cooke… - ..., 2006 - pediatricsdigest.mobi
OBJECTIVE. The purpose of this research was to assess the effects of breast milk on the severity and outcome of neonatal abstinence syndrome. METHODS. We conducted a retrospective chart review of 190 drug-dependent mother and infant pairs. Patients were ...
Cited by 71 - Related articles - Lancashire Teaching Hospitals - All 6 versions

A randomised controlled trial of morphine versus phenobarbitone for neonatal abstinence syndrome
Lancashire Teaching Hospitals, L Jackson, A Ting, S McKay, P Galea… - Archives of Disease in …, 2004 - ncbi.nlm.nih.gov
Background: The incidence of neonatal abstinence syndrome (NAS) has increased 10-fold over the last decade in Glasgow. In the Princess Royal Maternity Hospital, it now accounts for 17% of special care baby unit (SCBU) admissions. Objective: To compare opiate ...
Cited by 39 - Related articles - The Christie Online Journals - BL Direct - All 8 versions

Maternal methadone use in pregnancy: factors associated with the development of neonatal abstinence syndrome and implications for healthcare resources
Lancashire Teaching Hospitals, C Dryden, D Young, M Hepburn… - BJOG: An International …, 2009 - Wiley Online Library
Objectives The objectives of this study were to investigate factors associated with the development of neonatal abstinence syndrome (NAS) and to assess the implications for healthcare resources of infants born to drug-misusing women.
Cited by 34 - Related articles - Find@The Christie - All 8 versions

High-dose methadone in pregnant women and its effect on duration of neonatal abstinence syndrome in methadone-exposed infants is altered by level of prenatal tobacco exposure
Lancashire Teaching Hospitals, RE Choo, MA Huestis, JR Schroeder… - Drug and Alcohol …, 2004 - Elsevier
Maternal tobacco consumption during pregnancy has been associated with lower birth weight infants, preterm births, intrauterine growth retardation, smaller head circumference and increase in morbidity, yet few studies have examined the role tobacco has on the ...
Cited by 51 - Related articles - All 8 versions
Objective The purpose of this study was to examine high-dose methadone in pregnant women and its effect on the duration of neonatal abstinence syndrome. Study Design This was a retrospective chart review of 68 neonates and their mothers who received ...

Can methadone concentrations predict the severity of withdrawal in infants at risk of neonatal abstinence syndrome? [PDF] from nih.gov
Lancashire Teaching Hospitals C Kuschel, L Austerberry, M Cornwell...
Archives of Disease ...., 2004 - ncbi.nlm.nih.gov
Aim: To assess the usefulness of cord and serum methadone concentrations at 2 days of age in predicting the severity of neonatal abstinence syndrome (NAS) in infants whose mothers received methadone during pregnancy. Methods: After informed consent, infants

A retrospective study of length of hospital stay in infants treated for neonatal abstinence syndrome with methadone versus oral morphine preparations
S Lainwala, ER Brown, NP Weinschenk...
... in Neonatal Care, 2005 - journals.lww.com
PURPOSE: Length of hospital stay (LOS) of infants treated for neonatal abstinence syndrome (NAS) with methadone was compared to LOS of those treated with an oral morphine preparation (OMP, oral morphine solution, or deodorized tincture of opium)

Treatment of neonatal abstinence syndrome with breast milk containing methadone
JL Ballard - The Journal of perinatal & neonatal nursing, 2002 - journals.lww.com
Abstract This article addresses the management of pregnant women participating in a methadone maintenance program. An approach to management of the labor of a woman on a methadone maintenance program is described along with a summary of what to ...
maternal smoking. The neonatal withdrawal syndrome is characterized by irritability, ...


Lancashire Teaching Hospitals MJ O'Grady, J Hopewell... - Arch Dis Child Fetal ..., 2009 - senfiles.healthystartfv.org

ABSTRACT Aim: To ascertain the present management of neonatal abstinence syndrome (NAS) in neonatal units in the United Kingdom (UK) and Ireland. Methods: Postal questionnaire to 235 neonatal units, with telephone follow-up of non-respondents. Results

Increasing prevalence of neonatal withdrawal syndrome: population study of maternal factors and child protection involvement[HTML] from pediatricsdigest.mobi

The Christie Online Journals M O'Donnell, N Nassar, H Leonard, R Hagan... - Pediatrics, 2009 - Am Acad Pediatrics

OBJECTIVES. Illicit drug use during pregnancy is an important public health issue, with adverse effects on the newborn and implications for subsequent parenting. The aim of this study was to measure the birth prevalence of neonatal abstinence syndrome over time,

Neonatal abstinence syndrome and cerebral infarction following maternal codeine use during pregnancy

Lancashire Teaching Hospitals EW Reynolds, RMS Riel-Romero... - Clinical pediatrics, 2007 - cpj.sagepub.com

Abstract Neonatal withdrawal from maternal drugs and medications is common in some NICUs. Codeine-containing cough preparations given to pregnant mothers have been identified as a cause of neonatal abstinence syndrome. However, many women do not ...

[PDF] Can venlafaxine in breast milk attenuate the norepinephrine and serotonin reuptake neonatal withdrawal syndrome


Abstract A newborn infant whose mother had used venlafaxine, a selective inhibitor of both norepinephrine and serotonin reuptake, throughout pregnancy exhibited signs consistent with the norepinephrine and serotonin reuptake withdrawal syndrome. Is it possible that ...

Methadone dose and neonatal abstinence syndrome—systematic review and meta-analysis[PDF] from healthystartfv.org

Lancashire Teaching Hospitals BJ Cleary, J Donnelly, J Strawbridge... - Addiction, 2010 - Wiley Online Library

Aim To determine if there is a relationship between maternal methadone dose in pregnancy and the diagnosis or medical treatment of neonatal abstinence syndrome (NAS). Methods PubMed, EMBASE, the Cochrane Library and PsychINFO were searched for studies ...

Perinatal risk factors for the neonatal abstinence syndrome in infants born to women on methadone maintenance therapy

Lancashire Teaching Hospitals AJW Liu, MP Jones, H Murray... - Australian and New ..., 2010 - Wiley Online Library

Background: Neonatal abstinence syndrome (NAS) occurs in more than 50% of infants exposed to intrauterine opiates. Maternal opiate dosing has been investigated with conflicting results. Aims: The aims of this study were to correlate maternal methadone ...

Treatment of neonatal abstinence syndrome with clonidine and chloral hydrate

Lancashire Teaching Hospitals A Esmaeili, AK Keinhorst, T Schuster... - Acta ..., 2010 - Wiley Online Library

Aim: The objective of this retrospective study is to compare the medical treatment of
neonatal narcotic abstinence syndrome with clonidine and chloral hydrate with the commonly used combination therapy of morphine and phenobarbital. Methods: From 1998 to 2008, a total.

Comparison of chlorpromazine versus morphine hydrochloride for treatment of neonatal abstinence syndrome

Aim: To compare the duration of treatment for neonatal abstinence syndrome (NAS) using chlorpromazine versus morphine hydrochloride. Methods: We compared two case series of term infants with NAS treated with either morphine hydrochloride (MH) or chlorpromazine.

Neonatal withdrawal syndrome following in utero exposure to paroxetine, clonazepam and olanzapine

Abstract We describe a full-term infant with failed respiratory effort and decerebrate posturing following in utero exposure to paroxetine. All signs and symptoms associated with the paroxetine exposure were resolved by the second day of life. Upon discharge, the

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edmedicine.medscape.com/article/978763-treatment
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Neonatal Abstinence Syndrome - Psychiatric Times
www.psychiatrictimes.com/neonatal-abstinence-syndrome

Neonatal abstinence syndrome: MedlinePlus Medical Encyclopedia
Neonatal abstinence syndrome (NAS) is a group of problems that occur in a. Causes. Neonatal abstinence syndrome occurs because a pregnant woman takes ...

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Journal of Perinatology - Neonatal abstinence syndrome ...
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Queensland Maternity and Neonatal Clinical Guideline Supplement: Neonatal abstinence syndrome. Refer to online version, destroy printed copies after use ...

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www.hopkinscmme.edu/ofp/eneonatalreview/Newsletters/.../0411.pdf
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19 Apr 2011 – Neonatal abstinence syndrome (NAS) is a complex, commonly encountered clinical ... September 2, 2010; activities expire two years from ...

Neonatal Abstinence Syndrome: Reconstructing the Evidence ...
www.cwrp.ca/publications/1785
Home » Neonatal Abstinence Syndrome: Reconstructing the Evidence ... Additional information available for these authors: Marcellus, Lenora. Year of Publication: 2007. Link: ... Five Information Sheets related to CIS-2008 are now available online, as well as videos of Nico Trocmé's presentation. ... 27th Edition (June 2011) ... [PDF]

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