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Parkinson Disease in Pregnancy

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Evidence Summary:

- According to the Parkinson UK Prevalence and Incidence Report (2018) there are an estimated 1752 (1.2%) individuals aged <50 years with a diagnosis of Parkinson Disease in the UK. Unfortunately a breakdown of male/female ratio for this age range is not available.

- According to a results reported in a meta-analysis of 47 epidemiologic studies of Parkinson Disease, the estimated worldwide prevalence in individuals aged 40-49 years is 41 per 100,000 (Pringsheim, T. et al, 2014). The estimated worldwide prevalence of Parkinson Disease in females aged between 40-49 years is 45 per 100,000, whereas the prevalence for males is 36 per 100,000.
- A more recent systematic review (Hirsch, L et al 2016) reported a female incidence rate of 3.26 per 100,000 and 3.57 per 100,000 in males. This difference was not statistically significant.

1. Use of anti-Parkinson medication during pregnancy: a case series.

Author(s): Tüfekçioğlu, Zeynep; Hanağası, Haşmet; Yalçın Çakmaklı, Gül; Elibol, Bülent; Esmeli Tokuçoğlu, Figen; Kaya, Zeynep Ece; Ertan, Sibel; Özekmekçi, Sibel; Emre, Murat

Source: Journal of neurology; Aug 2018; vol. 265 (no. 8); p. 1922-1929

Publication Date: Aug 2018

Publication Type(s): Journal Article

PubMedID: 29926223

Abstract:INTRODUCTIONExperience about the use and safety of anti-Parkinson (anti-PD) medication during pregnancy is scarce.METHODSWe have retrospectively evaluated the course and outcome of pregnancy in PD patients who used anti-PD medication during their pregnancy.RESULTS14 PD patients who used anti-PD medication during part or whole of their pregnancy were included. Dopamine agonists were used in 13 patients, levodopa/benserazide in 4, levodopa/carbidopa/entacapone in 1, rasagiline in 7, amantadine in 4, and biperiden in 1 patient. Nine patients were on combination treatment at the time of their pregnancy. During their whole pregnancy, dopamine agonists had been used in six patients, levodopa in four, and rasagiline in one. Four patients experienced adverse outcomes: one had spontaneous abortion while receiving pramipexole, one elderly mother gave birth to a child with Down syndrome, while receiving pramipexole and rasagiline, in one case, there was fetal distress under levodopa/benserazide, piribedil, and rasagiline which resolved spontaneously, in one case, one of the twins did not survive after the birth while the mother was receiving pramipexole and rasagiline. In none of these cases an association with the use of anti-PD medication and adverse outcomes was clearly established. In one patient, motor symptoms worsened despite high dose levodopa, four others experienced transient worsening upon dose reduction.CONCLUSIONResults in our case series suggest that levodopa, rasagiline, pramipexole, and ropinirole alone or in combination with each other may be considered relatively safe during pregnancy. Expected benefits and risks should be considered when prescribing anti-PD medication in pregnant women.

Database: Medline

2. Young-onset Parkinson's disease: Its unique features and their impact on quality of life

Author(s): Mehanna R.; Jankovic J.

Source: Parkinsonism and Related Disorders; Aug 2019; vol. 65 ; p. 39-48

Publication Date: Aug 2019

Publication Type(s): Review

PubMedID: 31176633

Abstract: Young-onset Parkinson's disease (YOPD), defined as age at onset between 21 and 40 years, presents unique motor and non-motor features that differentiate this subtype from the typical late onset Parkinson's disease (LOPD), starting after age 61. Because it affects patients in the prime of their life, it often has an extraordinary impact on their family, social, and professional life. While typically progressing at a slower rate than LOPD, patients with YOPD are more prone to develop levodopa-related motor complications, including dyskinesia. In this article we will review the clinical features and epidemiology of YOPD with focus on its impact on pregnancy, employment and family, as well as its particular diagnostic and management challenges.Copyright © 2019

Database: EMBASE

3. Movement Disorders in Women

Author(s): Baker J.M.; Hung A.Y.

Source: Seminars in Neurology; Dec 2017; vol. 37 (no. 6); p. 653-660

Publication Date: Dec 2017

Publication Type(s): Article

PubMedID: 29270938

Abstract: Movement disorders such as Parkinson's disease (PD), restless legs syndrome (RLS), chorea, essential tremor, and Tourette syndrome, occur in men and women of all ages. Yet, considerable sex differences in epidemiology, clinical features, and treatment exist in these disorders. In this review, we highlight key differences in the evaluation and management of women with movement disorders, addressing sex-specific complications of treatment and unique challenges surrounding the management of movement disorders during pregnancy. We review the complex relationship between estrogen and movement disorders, including the putative neuroprotective effects of estrogen in PD and the modulatory effects on RLS and chorea associated with autoimmune disease. Further understanding of sex-specific and hormonal effects on clinical features will be important to optimize the management of women with movement disorders in the future.Copyright © 2017 by Thieme Medical Publishers, Inc.

Database: EMBASE

4. Parkinson's disease and pregnancy: An updated review.

Author(s): Seier, Mara; Hiller, Amie

Source: Parkinsonism & related disorders; Jul 2017; vol. 40 ; p. 11-17

Publication Date: Jul 2017

Publication Type(s): Journal Article Review

PubMedID: 28506531

Abstract: Pregnancy does not often occur in the setting of Parkinson's disease (PD) as the most common age of onset is beyond the childbearing years, yet management of these two conditions is crucial for the health of both mother and child. Here we review treatment data of PD during pregnancy, primarily from case reports and drug registries, and focus on available evidence regarding the pregnancy risks for patient and fetus. Historically, it was reported that many women had worsening of symptoms during pregnancy but this may be because anti-parkinsonian medications were not recommended or were under dosed. Levodopa has the best safety data for use in pregnancy and amantadine should be avoided in women who are pregnant or trying to become pregnant. The data for other pharmacological and surgical treatments is less clear. There is no evidence that women with PD have higher rates of birth or fetal complications.

Database: Medline

5. The Incidence of Parkinson's Disease: A Systematic Review and Meta-Analysis.

Author(s): Hirsch, Lauren; Jette, Nathalie; Frolkis, Alexandra; Steeves, Thomas; Pringsheim, Tamara

Source: Neuroepidemiology; 2016; vol. 46 (no. 4); p. 292-300

Publication Date: 2016

Publication Type(s): Meta-analysis Journal Article Review Systematic Review

PubMedID: 27105081

Abstract:BACKGROUNDParkinson's disease (PD) is a common neurodegenerative disorder. Epidemiological studies on the incidence of PD are important to better understand the risk factors for PD and determine the condition's natural history.OBJECTIVEThis systematic review and meta-analysis examine the incidence of PD and its variation by age and gender.METHODSWe searched MEDLINE and EMBASE for epidemiologic studies of PD from 2001 to 2014, as a previously published systematic review included studies published until 2001. Data were analyzed separately for age group and gender, and meta-regression was used to determine whether a significant difference was present between groups.RESULTSTwenty-seven studies were included in the analysis. Meta-analysis of international studies showed rising incidence with age in both men and women. Significant heterogeneity was observed in the 80+ group, which may be explained by methodological differences between studies. While males had a higher incidence of PD in all age groups, this difference was only statistically significant for those in the age range 60-69 and 70-79 ($p < 0.05$).CONCLUSIONPD incidence generally increases with age, although it may stabilize in those who are 80+.

Database: Medline

6. The prevalence of Parkinson's disease: a systematic review and meta-analysis.

Author(s): Pringsheim, Tamara; Jette, Nathalie; Frolkis, Alexandra; Steeves, Thomas D L

Source: Movement disorders : official journal of the Movement Disorder Society; Nov 2014; vol. 29 (no. 13); p. 1583-1590

Publication Date: Nov 2014

Publication Type(s): Research Support, Non-u.s. Gov't Meta-analysis Journal Article Review Systematic Review

PubMedID: 24976103

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Abstract: Parkinson's Disease (PD) is a common neurodegenerative disorder. We sought to synthesize studies on the prevalence of PD to obtain an overall view of how the prevalence of this disease varies by age, by sex, and by geographic location. We searched MEDLINE and EMBASE for epidemiological studies of PD from 1985 to 2010. Data were analyzed by age group, geographic location, and sex. Geographic location was stratified by the following groups: 1) Asia, 2) Africa, 3) South America, and 4) Europe/North America/Australia. Meta-regression was used to determine whether a significant difference was present between groups. Forty-seven studies were included in the analysis. Meta-analysis of the worldwide data showed a rising prevalence of PD with age (all per 100,000): 41 in 40 to 49 years; 107 in 50 to 59 years; 173 in 55 to 64 years; 428 in 60 to 69 years; 425 in 65 to 74 years; 1087 in 70 to 79 years; and 1903 in older than age 80. A significant difference was seen in prevalence by geographic location only for individuals 70 to 79 years old, with a prevalence of 1,601 in individuals from North America, Europe, and Australia, compared with 646 in individuals from Asia ($P < 0.05$). A significant difference in prevalence by sex was found only for individuals 50 to 59 years old, with a prevalence of 41 in females and 134 in males ($P < 0.05$). PD prevalence increases steadily with age. Some differences in prevalence by geographic location and sex can be detected.

Database: Medline

7. Two cases of pregnancy in Parkinson's disease.

Author(s): Lamichhane, Dronacharya; Narayanan, N S; Gonzalez-Alegre, Pedro

Source: Parkinsonism & related disorders; Feb 2014; vol. 20 (no. 2); p. 239-240

Publication Date: Feb 2014

Publication Type(s): Letter Case Reports

PubMedID: 24182521

Available at Parkinsonism & related disorders - from Unpaywall

Database: Medline

8. Movement disorders in women: A review

Author(s): Rabin M.L.; Stevens-Haas C.; Havrilla E.; Devi T.; Kurlan R.

Source: Movement Disorders; Feb 2014; vol. 29 (no. 2); p. 177-183

Publication Date: Feb 2014

Publication Type(s): Review

PubMedID: 24151214

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Abstract: The field of women's health developed based on the recognition that there are important sex-based differences regarding several aspects of medical illnesses. We performed a literature review to obtain information about differences between women and men for neurological movement disorders. We identified important differences in prevalence, genetics, clinical expression, course, and treatment responses. In addition, we found that female life events, including menstruation, pregnancy, breast feeding, menopause, and medications prescribed to women (such as oral contraceptives and hormone-replacement therapy), have significant implications for women with movement disorders. Understanding this biological sex-specific information can help improve the quality and individualization of care for women with movement disorders and may provide insights into neurobiological mechanisms. © 2013 Movement Disorder Society.

Database: EMBASE

9. Successful pregnancy and delivery in a patient with Parkinson's disease under pramipexole treatment.

Author(s): Benbir, Gulcin; Ertan, Sibel; Ozekmekci, Sibel

Source: Presse medicale (Paris, France : 1983); Jan 2014; vol. 43 (no. 1); p. 83-85

Publication Date: Jan 2014

Publication Type(s): Letter Case Reports

PubMedID: 23688703

Database: Medline

10. Epidemiology and neuropsychiatric manifestations of Young Onset Parkinson's Disease in the United States

Author(s): Willis A.W.; Kung N.; Racette B.A.; Schootman M.

Source: Parkinsonism and Related Disorders; Feb 2013; vol. 19 (no. 2); p. 202-206

Publication Date: Feb 2013

Publication Type(s): Article

PubMedID: 23083512

Available at Parkinsonism & related disorders - from Unpaywall

Abstract: Background: To determine the demographic distribution of Young Onset Parkinson's Disease (YOPD) in the United States and to quantify the burden of neuropsychiatric disease manifestations. Method(s): Cross sectional study of 3,459,986 disabled Americans, aged 30-54, who were receiving Medicare benefits in the year 2005. We calculated race and sex distributions of YOPD and used logistic regression to compare the likelihood of common and uncommon psychiatric disorders between beneficiaries with YOPD and the general disability beneficiary population, adjusting for race, age, and sex. Result(s): We identified 14,354 Medicare beneficiaries with YOPD (prevalence = 414.9 per 100,000 disabled Americans). White men comprised the majority of cases (48.9%), followed by White women (34.7%), Black men (6.8%), Black women (5.0%), Hispanic men (2.4%), and Hispanic women (1.2%). Asian men (0.6%) and Asian women (0.4%) were the least common race-sex pairs with a YOPD diagnosis in this population (chi square, $p < 0.001$). Compared to the general population of medically disabled Americans, those with YOPD were more likely to receive medical care for depression (OR: 1.89, 1.83-1.95), dementia (OR: 7.73, 7.38-8.09), substance abuse/dependence (OR: 3.00, 2.99-3.01), and were more likely to be hospitalized for psychosis (OR: 3.36, 3.19-3.53), personality/impulse control disorders (OR: 4.56, 3.28-6.34), and psychosocial dysfunction (OR: 3.85, 2.89-5.14). Conclusion(s): Young Onset Parkinson's Disease is most common among white males in our study population. Psychiatric illness, addiction, and cognitive impairment are more common in YOPD than in the general population of disabled Medicare beneficiaries. These may be key disabling factors in YOPD. © 2012 Elsevier Ltd.

Database: EMBASE

11. A case control study of women with Parkinson's disease and their fertility characteristics.

Author(s): Yadav, Ravi; Shukla, Garima; Goyal, Vinay; Singh, Sumit; Behari, Madhuri

Source: Journal of the neurological sciences; Aug 2012; vol. 319 (no. 1-2); p. 135-138

Publication Date: Aug 2012

Publication Type(s): Journal Article

PubMedID: 22647587

Abstract:BACKGROUNDParkinson disease (PD) is less common in women and studies have shown that oestrogen is protective to dopaminergic neurons in primate models. The findings in clinical and epidemiological studies have not clearly established this observation. This study was undertaken to evaluate associations of reproductive characteristics in a population with higher fertility and risk of PD among women.METHODSTrained interviewers used structured interviews to obtain information about demographic characteristics and reproductive history from women subjects with PD. An equal number of healthy age matched female controls were also studied to compare their reproductive characteristics with women with PD.RESULTSWe recruited 81 consecutive women with PD and age matched healthy women controls. Mean age at interview was 55.89 ± 10.07 years for women with PD, 55.05 ± 10.53 years for controls. Significant positive correlation was observed with cumulative length of pregnancy ($r=0.32$; $p=0.003$), age at menopause ($r=0.55$; $p=0.001$) and length of fertile life

with age of onset of PD (r=0.27; p=0.02). Gravidity (r=0.26; p=0.02) and parity (r=0.35; p=0.001) also correlated positively with age at onset.CONCLUSIONThe onset of PD is delayed in women with higher number of pregnancies, longer fertile life and longer cumulative length of pregnancies. This could also explain the epidemiological observations of lower incidence of PD in women and the protective role of estrogens.

Database: Medline

12. Successful twin pregnancy in a patient with parkin-associated autosomal recessive juvenile parkinsonism.

Author(s): Serikawa, Takehiro; Shimohata, Takayoshi; Akashi, Mami; Yokoseki, Akio; Tsuchiya, Miwa; Hasegawa, Arika; Haino, Kazufumi; Koike, Ryoko; Takakuwa, Koichi; Tanaka, Keiko; Tanaka, Kenichi; Nishizawa, Masatoyo

Source: BMC neurology; Jun 2011; vol. 11 ; p. 72

Publication Date: Jun 2011

Publication Type(s): Case Reports Journal Article

PubMedID: 21682904

Available at BMC neurology - from BioMed Central

Available at BMC neurology - from SpringerLink - Medicine

Available at BMC neurology - from Europe PubMed Central - Open Access

Available at BMC neurology - from ProQuest (Health Research Premium) - NHS Version

Available at BMC neurology - from Unpaywall

Abstract:BACKGROUNDPregnancy in patients with Parkinson disease is a rare occurrence. To the best of our knowledge, the effect of pregnancy as well as treatment in genetically confirmed autosomal recessive juvenile parkinsonism (ARJP) has never been reported. Here, we report the first case of pregnancy in a patient with ARJP associated with a parkin gene mutation, ARJP/PARK2.CASE PRESENTATIONA 27-year-old woman with ARJP/PARK2 was diagnosed as having a spontaneous dichorionic/diamniotic twin pregnancy. Exacerbation of motor disability was noted between ovulation and menstruation before pregnancy as well as during late pregnancy, suggesting that her parkinsonism might have been influenced by fluctuations in the levels of endogenous sex hormones. During the organogenesis period, she was only treated with levodopa/carbidopa, although she continued to receive inpatient hospital care for assistance in the activities of daily living. After the organogenesis period, she was administered sufficient amounts of antiparkinsonian drugs. She delivered healthy male twins, and psychomotor development of both the babies was normal at the age of 2 years.CONCLUSIONPregnancy may worsen the symptoms of ARJP/PARK2, although appropriate treatments with antiparkinsonian drugs and adequate assistance in the activities of daily living might enable successful pregnancy and birth of healthy children.

Database: Medline

13. A systematic review of the worldwide prevalence and incidence of Parkinson's disease.

Author(s): Muangpaisan, Weerasak; Mathews, Aju; Hori, Hiroyuki; Seidel, David

Source: Journal of the Medical Association of Thailand = Chotmaihet thangphaet; Jun 2011; vol. 94 (no. 6); p. 749-755

Publication Date: Jun 2011

Publication Type(s): Journal Article Review Systematic Review

PubMedID: 21696087

Abstract:BACKGROUNDA number of epidemiologic studies of Parkinson 's disease (PD) have been conducted worldwide over the years. Although every study reported the rise in prevalence and incidence rate of PD with the increasing age, the overall estimates were different across countries. The variation in reported data may partly be contributed by case ascertainment, case finding method, data collection, and most importantly different population structures.OBJECTIVESystematically review prevalence and incidence of PD and find the causes of variation in the results.MATERIAL AND METHODA literature search was conducted on Medline and EMBASE for studies worldwide investigating the prevalence and incidence of PD and included all adults, English and publication between 1965 and January 2010. The primary search of both databases yielded 5,330 results. After screening topics and abstracts, 168 relevant abstracts were tagged and saved for more thorough perusal. Ultimately, 40 papers were selected for review after applying the pre-specified inclusion criteriaRESULTSThe worldwide prevalence of PD varies widely. One reason for the variation in prevalence estimates could be due to the differences in survival across countries. The use of epidemiological studies using medical records could be another reason for the variation in disease frequency.CONCLUSIONPD is common in the elderly. A number of descriptive epidemiologic studies have been conducted worldwide. Comparing the incidence and prevalence of Parkinson's disease is difficult.

Database: Medline

14. Pregnancy in a woman with early-onset Parkinson's disease and Tourette syndrome

Author(s): Santos J.G.; Chien H.F.; Barbosa E.R.

Source: Movement Disorders; May 2011; vol. 26

Publication Date: May 2011

Publication Type(s): Conference Abstract

Available at Movement Disorders - from Wiley Online Library

Abstract: Objective: To report a case of early onset Parkinson s disease (EOPD) due to familial parkin mutation and Tourette syndrome (TS) treated with pramipexole during pregnancy. To discuss the concomitant manifestation of parkinsonism and tics. Background(s): Case Report: A 28-year-old female patient presents vocal and motor tics since early childhood characterizing TS. She never sought for treatment because the tics were mild and never interfered with her daily activities. Five years ago, she came to our Movement Disorder Clinic because of mild resting tremor and rigidity in the right arm and periodical dystonic posture on right foot. She belongs to a big family with intricated marriage between cousins resulting in many PD members due to parkin mutation (Chien et al, 2006). Because her symptoms got worse, four years ago biperiden was introduced, and few months later selegiline was added. She could not tolerate both medications so pramipexole was prescribed and it improved her clinical picture satisfactorily. No worsening of tics was noticed and the dosage of pramipexole was titrated up to 3mg daily. One year later the patient got pregnant. We tried to diminish the dose of pramipexole but her parkinsonian symptoms worsened considerably, and the patient refused to change the medication regimen. No complications were observed on the fetus during pregnancy. Delivery occurred at 39 weeks, and both mother and baby were discharged from the hospital three days later. The child is healthy and acquiring the development milestones in due time. The concomitant manifestation of tic (hyperkinetic movement disorder) and parkinsonism (hypokinetic movement disorder) in this patient is peculiar and no other case has been described to our knowledge. Although DeLong circuitry is useful for the comprehension of most common movement disorders it may not explain the pathophysiology of both disease, PD and TS. Conclusion(s): There are few reports in the literature about the use of antiparkinsonian drugs during pregnancy and its effects on the fetus. Female patients with EOPD require special care during fertile period because of the risk of pregnancy and the use of medication during this must be well monitored.

Database: EMBASE

15. Movement disorders and pregnancy: a review of the literature.

Author(s): Kranick, Sarah M; Mowry, Ellen M; Colcher, Amy; Horn, Stacy; Golbe, Lawrence I

Source: Movement disorders : official journal of the Movement Disorder Society; Apr 2010; vol. 25 (no. 6); p. 665-671

Publication Date: Apr 2010

Publication Type(s): Journal Article Review

PubMedID: 20437535

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Abstract: Pregnant patients are rarely encountered in the movement disorders clinic, but they present significant dilemmas regarding treatment and counseling for neurologists. While movement disorders in pregnancy once described those disorders arising de novo during pregnancy, such as chorea gravidarum or restless leg syndrome, advancing maternal age in Western countries will likely increase the number of women in whom pregnancy complicates a pre-existing movement disorder. Physicians treating these women must be aware of the impact of the movement disorder and its treatment on fertility, pregnancy, fetal development, lactation, and infant care. This review summarizes retrospective series and case reports to both guide clinicians and to stimulate and direct the design of prospective studies.

Database: Medline

16. Parkinson's disease in women: a call for improved clinical studies and for comparative effectiveness research.

Author(s): Pavon, J M; Whitson, H E; Okun, M S

Source: Maturitas; Apr 2010; vol. 65 (no. 4); p. 352-358

Publication Date: Apr 2010

Publication Type(s): Research Support, Non-u.s. Gov't Research Support, N.i.h., Extramural Journal Article Review

PubMedID: 20117891

Available at Maturitas - from Unpaywall

Abstract: The incidence and prevalence of Parkinson's disease (PD) is expected to rise precipitously over the next several decades, as will the associated healthcare related costs. The epidemiology and disease manifestations of PD may differ when comparing women to men. Women are for example less likely to acquire PD, and in several studies have demonstrated a delayed onset of motor symptoms. Women, however, are more likely to experience PD-related complications that may lead to disability (e.g. depression and medication-associated dyskinesia). Further, there are purported differences in the treatment and treatment outcomes in PD men compared to women. Whether estrogen, other hormonal activity, or whether multiple factors underpin these findings remains unknown. Also unknown is whether estrogen itself may represent a therapeutic option for symptomatic PD treatment. This review summarizes what is known about gender differences in epidemiology, clinical features, treatment outcomes (medical and surgical/deep brain stimulation), and social impact among all available PD studies. We offer expert opinion regarding the shortcomings of the current evidence, and we propose a detailed list of studies that will help to clarify important gender related PD questions. Our hope is that this review will spark comparative effectiveness research into improving care and outcomes in women with PD.

Database: Medline

17. Early-onset parkinsonism and pregnancy

Author(s): Damasio J.; Magalhaes M.

Source: Sinapse; May 2009; vol. 9 (no. 1); p. 64-66

Publication Date: May 2009

Publication Type(s): Article

Abstract: Introduction: Pregnancy in Parkinson's disease (PD) patients is rare. The impact of pregnancy on Parkinson's disease (PD) progression, the teratogenicity of antiparkinsonian medication, the course of the pregnancy and delivery are crucial issues. Case Report: We describe the case of a 35 year-old parkinsonian woman who became pregnant twice. The first pregnancy ended in an early miscarriage, attributed to a silent rubella infection; the second pregnancy was full-term and culminated in a caesarean delivery. Medication was stopped during both pregnancies with minor clinical deterioration. Conclusion(s): In this patient, the PD treatment had no impact on pregnancy and there was no teratogenicity. We believe that the clinical deterioration during pregnancy was related to the disease's natural history.

Database: EMBASE

18. Pregnancy in Parkinson's disease: case report and discussion.

Author(s): Robottom, Bradley J; Mullins, Roger J; Shulman, Lisa M

Source: Expert review of neurotherapeutics; Dec 2008; vol. 8 (no. 12); p. 1799-1805

Publication Date: Dec 2008

Publication Type(s): Research Support, Non-u.s. Gov't Case Reports Journal Article Review

PubMedID: 19086876

Abstract: Pregnancy in Parkinson's disease (PD) is an uncommon occurrence. Available reports suggest that there may be a worsening of PD symptom severity related to pregnancy. In this special report, medical literature on pregnancy in PD will be reviewed with regard to disease progression and the safety of antiparkinsonian medications. A case report of pregnancy in a woman with PD will be described. It is speculated that the symptoms of PD may be affected by changing hormone levels.

Database: Medline

19. Multiparity after an initial diagnosis of Parkinson's disease: a report on a rare case.

Author(s): Campos-Sousa, Raimundo Nonato; Almeida, Kelson James; Dos Santos, Alesse Ribeiro; Lopes-Costa, Pedro Vitor; da Silva, Benedito Borges

Source: Fertility and sterility; Nov 2008; vol. 90 (no. 5); p. 2005

Publication Date: Nov 2008

Publication Type(s): Journal Article

PubMedID: 18377902

Abstract:OBJECTIVETo report a very rare case of multiparity after a diagnosis of Parkinson's disease (PD).DESIGNCase report.SETTINGDepartment of neurology and gynecology of a university teaching hospital.PATIENT(S)A 36-year-old multiparous woman.INTERVENTION(S)Treatment of PD during pregnancy.MAIN OUTCOME MEASURE(S)The effect of multiparity on PD.RESULT(S)Multiparity had no effect on the progression of PD, and treatment of the disease during pregnancy appears to have been safe.CONCLUSION(S)Multiparity after a diagnosis of PD is extremely rare and, in the present case, had no effect on the progression of the disease.

Database: Medline

20. Movement disorders in pregnancy

Author(s): Bordelon Y.M.; Smith M.

Source: Seminars in Neurology; Nov 2007; vol. 27 (no. 5); p. 467-475

Publication Date: Nov 2007

Publication Type(s): Review

PubMedID: 17940926

Abstract: Movement disorders are not commonly seen during pregnancy. As a result, there are few studies on whether disease manifestations are affected by the hormonal changes that occur during pregnancy or on the teratogenicity of commonly used medications for movement disorders on the developing fetus. This article discusses movement disorders that are seen only during pregnancy (chorea gravidarum) or that may present during pregnancy (restless legs syndrome), the effect that pregnancy has on symptoms and treatment (in Parkinson's disease, essential tremor, dystonia, tic disorders, and Wilson's disease), and the role of genetic testing for movement disorders in genetic counseling for pregnant women.

Database: EMBASE

21. Parkinson's disease in women.

Author(s): Rubin, Susan M

Source: Disease-a-month : DM; Apr 2007; vol. 53 (no. 4); p. 206-213

Publication Date: Apr 2007

Publication Type(s): Journal Article Review

PubMedID: 17586327

Database: Medline

22. Gender disparities in Parkinson's disease.

Author(s): Shulman, Lisa M; Bhat, Viveca

Source: Expert review of neurotherapeutics; Mar 2006; vol. 6 (no. 3); p. 407-416

Publication Date: Mar 2006

Publication Type(s): Comparative Study Journal Article Review

PubMedID: 16533144

Available at Expert review of neurotherapeutics - from ProQuest (Health Research Premium) - NHS Version

Abstract: Parkinson's disease is a chronic neurodegenerative disorder of unknown etiology. There are sparse data on gender differences in this disorder, but it is clear that there are gender discrepancies in incidence, symptoms, medication effects and treatments. There also appear to be lifecycle fluctuations in the disease course of female Parkinson's disease patients. The effect of estrogen in this disorder is multifold and its role in the development and treatment of PD will be discussed.

Database: Medline

23. Pregnancy in Parkinson's disease: unique case report and review of the literature.

Author(s): Scott, Michael; Chowdhury, Muhammad

Source: Movement disorders : official journal of the Movement Disorder Society; Aug 2005; vol. 20 (no. 8); p. 1078-1079

Publication Date: Aug 2005

Publication Type(s): Letter Case Reports Review

PubMedID: 16001415

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Database: Medline

24. Prevalence and incidence of Parkinson's disease in Europe.

Author(s): von Campenhausen, Sonja; Bornschein, Bernhard; Wick, Regina; Bötzel, Kai; Sampaio, Cristina; Poewe, Werner; Oertel, Wolfgang; Siebert, Uwe; Berger, Karin; Dodel, Richard

Source: European neuropsychopharmacology : the journal of the European College of Neuropsychopharmacology; Aug 2005; vol. 15 (no. 4); p. 473-490

Publication Date: Aug 2005

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article Review

PubMedID: 15963700

Abstract:OBJECTIVETo provide an overview on the prevalence and incidence of Parkinson's disease (PD) in selected European countries.BACKGROUNDPD is a common disease of unknown etiology. Accurate information on the epidemiology of PD is critical to inform health policy. An aging population will lead to more patients with PD; thus, the high financial burden PD places on society will increase.MATERIAL AND METHODSA systematic literature search was performed to identify studies on the prevalence and incidence of PD in the following European countries: Austria, the Czech Republic, France, Germany, Italy, The Netherlands, Portugal, Spain, Sweden and United Kingdom. Only published studies were included. Abstracts, reviews, meta-analyses and letters to the editor were excluded. There were no language restrictions. Data were extracted using a standardized assessment form, and evidence tables were used to systematically report and compare the data.RESULTSOf 39 identified studies, most (87%) reported estimates of PD prevalence rates, while only a few (13%) reported estimates of PD annual incidence rates. Crude prevalence rate estimates ranged from 65.6 per 100,000 to 12,500 per 100,000 and annual incidence estimates ranged from 5 per 100,000 to 346 per 100,000. No publications could be identified for Austria or the Czech Republic.DISCUSSION AND CONCLUSIONThe observed variations in prevalence and incidence rates may result from environmental or genetic factors, but might also be a consequence of differences in methodologies for case ascertainment, diagnostic criteria, or age distributions of the study populations. The comparability of existing studies is limited.

Database: Medline

25. Movement disorders in pregnancy

Author(s): Smith M.S.A.; Evatt M.L.

Source: Neurologic Clinics; Nov 2004; vol. 22 (no. 4); p. 783-798

Publication Date: Nov 2004

Publication Type(s): Review

PubMedID: 15474767

Abstract: Movement disorders are not particularly common during pregnancy, with a few exceptions. RLS occurs most commonly followed by CG. Currently, with the incidence of rheumatic fever lower than previously, any woman who develops CG should be checked for illness other than rheumatic heart disease. The differential includes systemic lupus erythromatosis and antiphospholipid antibody syndrome [21]. Regarding the use of dopaminergic agents, the dopamine agonist, pergolide, can be maintained during pregnancy for the treatment of PD, Segawa disease, and RLS. The use of levodopa and ropinirole should be limited during pregnancy because of the possible teratogenic effects. Amantadine is contraindicated during pregnancy [54]. The data on selegiline are controversial; animal studies show possible serotonergic effects [52] and teratogenic effects [53]. If treatment is indicated in patients who have Tourette syndrome, the high potency neuroleptics drugs (haloperidol) are preferred to treat associated symptoms [38]. Depression is a common comorbidity in patients who have PD, HD, Tourette syndrome, or other chronic neurologic diseases. Depression treatment during pregnancy is covered by Levy et al elsewhere in this issue. As discussed previously, most of the data on the use of drugs during pregnancy, especially the dopaminergic agents, are limited to animal studies and case reports. Therefore, it is in part left to the neurologist to decide on treatment based on the individual patient, clinical judgment, and inferences from animal studies and limited case reports.

Database: EMBASE

26. Pramipexole-treated Parkinson's disease during pregnancy.

Author(s): Mucchiut, Marco; Belgrado, Enrico; Cutuli, Daniela; Antonini, Angelo; Bergonzi, Paolo

Source: Movement disorders : official journal of the Movement Disorder Society; Sep 2004; vol. 19 (no. 9); p. 1114-1115

Publication Date: Sep 2004

Publication Type(s): Case Reports Journal Article

PubMedID: 15372610

Abstract: There are few reports about drug-related effects on PD pregnancy. We describe the case of a woman affected by PD treated with pramipexole monotherapy during pregnancy. The child, born by caesarean delivery, is healthy, whereas motor disability of the mother progressively increased to the point that levodopa therapy was necessary.

Database: Medline

27. Parkinson's disease and reproductive life events.

Author(s): Martignoni, E; Nappi, R E; Citterio, A; Calandrella, D; Corengia, E; Fignon, A; Zangaglia, R; Riboldazzi, G; Pacchetti, C; Nappi, G

Source: Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology; Sep 2002; vol. 23

Publication Date: Sep 2002

Publication Type(s): Journal Article

PubMedID: 12548356

Available at Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology - from SpringerLink - Medicine

Available at Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology - from ProQuest (Health Research Premium) - NHS Version

Available at Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology - from EBSCO (Psychology and Behavioral Sciences Collection)

Abstract: Onset, progression and duration of Parkinson's disease (PD) seem to be similar in men and women but gender differences have been suggested concerning clinical aspects, such as more severe disease in men and more dyskinesia in women. Taking into account the multiple influences of sex hormones, estrogens in particular, on basal ganglia function, the present work compared the characteristics of reproductive events in PD subjects and in healthy women, with regard to onset and clinical aspects of the disease with respect to the milestones of reproductive life. A total of 150 PD women and 200 healthy women matched for age were interviewed about reproductive life and disease characteristics (if patients). As a group, the women with PD had menarche later than the controls, but in the normal range. Menopause was similar to the controls for time, type (natural) and onset (slow), but with less hormonal therapies. Women with PD had fewer children, while breast feeding and gynecological diseases were comparable to controls. The characteristics of menses were similar as far as dysmenorrhea and premenstrual syndrome (PMS). The women with PD onset before menopause had a longer disease duration, with a more frequent fluctuating stage, and longer treatment with both levodopa and dopamine agonists. They had more dysmenorrhea and PMS when compared with women with PD onset after menopause and controls.

Database: Medline

28. Antiparkinsonian treatment in pregnancy.

Author(s): De Mari, Michele; Zenzola, Angelo; Lamberti, Paolo

Source: Movement disorders : official journal of the Movement Disorder Society; Mar 2002; vol. 17 (no. 2); p. 428-429

Publication Date: Mar 2002

Publication Type(s): Letter Case Reports Comment

PubMedID: 11921143

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Database: Medline

29. The effect of pregnancy in Parkinson's disease.

Author(s): Shulman, L M; Minagar, A; Weiner, W J

Source: Movement disorders : official journal of the Movement Disorder Society; Jan 2000; vol. 15 (no. 1); p. 132-135

Publication Date: Jan 2000

Publication Type(s): Research Support, Non-u.s. Gov't Case Reports Journal Article

PubMedID: 10634252

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Abstract: Pregnancy in patients with Parkinson's disease (PD) is a rare occurrence. Previous reports based on retrospective analysis suggest that pregnancy may have a deleterious effect on PD. We describe the effects of pregnancy on the symptomatology of a 33-year-old woman with PD using quantitative neurologic and quality-of-life scales prepartum, intrapartum, and postpartum. During her pregnancy, she was only treated with carbidopa/levodopa. The pregnancy resulted in a normal full-term vaginal delivery of a healthy infant. Significant worsening of this patient's motor symptoms occurred during pregnancy without return to baseline at 15 months postpartum. Pregnancy may exacerbate PD and may have a long-term negative impact on the course of the illness. This report may assist physicians in the counseling of patients with young-onset PD who wish to consider pregnancy.

Database: Medline

30. Pregnancy in Parkinson's disease: a review of the literature and a case report.

Author(s): Benito-León, J; Bermejo, F; Porta-Etessam, J

Source: Movement disorders : official journal of the Movement Disorder Society; Jan 1999; vol. 14 (no. 1); p. 194

Publication Date: Jan 1999

Publication Type(s): Letter Case Reports Comment Review

PubMedID: 9918378

Available at Movement disorders : official journal of the Movement Disorder Society - from Wiley Online Library

Database: Medline

31. Pregnancy in Parkinson's disease: A review of the literature and a case report

Author(s): Hagell P.; Odin P.; Vinge E.

Source: Movement Disorders; 1998; vol. 13 (no. 1); p. 34-38

Publication Date: 1998

Publication Type(s): Article

PubMedID: 9452323

Abstract: Pregnancy is rare in Parkinson's disease (PD). In the literature on studies of antiparkinsonian drugs in animals during pregnancy, there are reports on malformations of the skeletal and circulatory system. However, the majority of studies in animals have not shown any teratogenicity. Amantadine has been teratogenic in rats and selegiline has caused neurochemical and behavioral alterations in rats when coadministered with clorgyline. The published experience with humans consists of 35 pregnancies among 26 women suffering from PD, including this report, and a number of cases treated with antiparkinsonian agents for other reasons. With the exception of the majority of the cases where amantadine was used, complications have been rare. However, there are indications that suggest a possible risk of a woman's parkinsonism worsening in connection with pregnancy. We also report the case of a woman with PD who was treated with L-dopa-benserazide during an uncomplicated pregnancy and gave birth to a healthy boy without experiencing any worsening of her PD.

Database: EMBASE

32. Pregnancy and movement disorders.

Author(s): Golbe, L I

Source: Neurologic clinics; Aug 1994; vol. 12 (no. 3); p. 497-508

Publication Date: Aug 1994

Publication Type(s): Journal Article Review

PubMedID: 7990787

Abstract: The concurrence of pregnancy and movement disorders is an uncommon event in a general neurologic practice. Even at specialized movement disorder referral centers, there is insufficient experience to adequately guide management of pregnancy, except perhaps in the case of WD. The questions posed most urgently by patients regard the safety of medication, an issue on which there is insufficient data, and their ability to care for a child for at least the next decade, an issue that differs by disease and social situation. The author's formulation of efficacy and toxicity suggests that certain medications commonly used in movement disorders should be discontinued before pregnancy, if possible. These medications include neuroleptics, amantadine, diazepam, primidone, selegiline, and reserpine. Pregnancy may unmask a pre-existing potential for chorea (i.e., chorea gravidarum) and frequently has a mild exacerbating effect on symptoms of PD; however, it has little effect on other movement disorders. Severe generalized dystonia would probably interfere with vaginal delivery, but the scant existing data suggest minimal effect of movement disorders on pregnancy, childbirth, and neonatal health.

Database: Medline

33. Pregnancy and parkinsonism. A case report without problem.

Author(s): Allain, H; Bentue-Ferrer, D; Milon, D; Moran, P; Jacquemard, F; Defawe, G

Source: Clinical neuropharmacology; Jun 1989; vol. 12 (no. 3); p. 217-219

Publication Date: Jun 1989

Publication Type(s): Case Reports Journal Article

PubMedID: 2743345

Database: Medline

34. Parkinson's disease and pregnancy.

Author(s): Golbe, L I

Source: Neurology; Jul 1987; vol. 37 (no. 7); p. 1245-1249

Publication Date: Jul 1987

Publication Type(s): Journal Article

PubMedID: 3601093

Abstract: In an effort to study the interaction of pregnancy and Parkinson's disease (PD), I interviewed 18 women who had had a total of 24 pregnancies after onset of PD symptoms. Conception occurred at mean age 34.7 (SD 6.1) years. There were 3 miscarriages, 4 elective abortions, and 17 term pregnancies. Use of amantadine during the first trimester was associated with a heterogeneous group of obstetric complications including miscarriage. Ten of the 17 completed pregnancies were associated with permanent worsening of PD symptoms, which did not affect overall disability. Among the series as a whole there was no excess incidence of obstetric complications or fetal defects.

Database: Medline

Strategy 791706

#	Database	Search term	Results
1	Medline	(parkinson*).ti	65319
2	Medline	exp "PARKINSON DISEASE"/	61731
3	Medline	(1 OR 2)	82385
4	Medline	(pregnan*).ti	224160
5	Medline	exp PREGNANCY/	854707
6	Medline	(4 OR 5)	885559
7	Medline	(3 AND 6)	329
8	Medline	exp "SEX CHARACTERISTICS"/	51185
9	Medline	(3 AND 8)	170
10	Medline	*"PARKINSON DISEASE"/ep	2067
11	Medline	10 [Document type Review]	286
12	Medline	(8 AND 10)	21
13	Medline	(male ADJ2 female).ti,ab	170679
14	Medline	(ratio).ti	41583
15	Medline	(3 AND 13 AND 14)	4
16	Medline	((gender OR sex) ADJ2 ratio).ti,ab	17877
17	Medline	(3 AND 16)	37
18	Medline	*"SEX CHARACTERISTICS"/	19898
19	Medline	(3 AND 18)	64

20	Medline	(young* ADJ2 (women OR female*)).ti,ab	56717
21	Medline	(3 AND 20)	37
22	EMBASE	(parkinson*).ti	90929
23	EMBASE	exp "PARKINSON DISEASE"/	147912
24	EMBASE	(22 OR 23)	158491
25	EMBASE	(pregnan*).ti	247002
26	EMBASE	exp PREGNANCY/	648841
27	EMBASE	(25 OR 26)	701198
28	EMBASE	(24 AND 27)	471
29	EMBASE	(23 AND 26)	419
30	EMBASE	("young onset parkinson* disease").ti	98
31	EMBASE	("young onset parkinson* disease").ti,ab	199
32	EMBASE	exp "SEX DIFFERENCE"/	365598
33	EMBASE	(31 AND 32)	1
34	EMBASE	((gender OR sex) ADJ2 (ratio*1 OR distribution*)).ti,ab	39902
35	EMBASE	(31 AND 34)	1
36	Medline	("young onset parkinson disease").ti,ab	13
37	EMBASE	(female*).ti,ab	1391002
38	EMBASE	(31 AND 37)	23
39	EMBASE	(age* ADJ2 50).ti,ab	75189

40	EMBASE	(age* ADJ2 fifty).ti,ab	2201
41	EMBASE	(39 OR 40)	77286
42	EMBASE	(24 AND 41)	625
43	EMBASE	exp "AGE DISTRIBUTION"/	138794
44	EMBASE	(24 AND 43)	792
45	EMBASE	(young*).ti	167363
46	EMBASE	(24 AND 45)	414
47	EMBASE	(43 AND 46)	8
48	Medline	(prevalence OR incidence).ti	224425
49	Medline	(10 AND 48)	306