# W27: Neurogenic urinary tract dysfunction and Pregnancy

Workshop Chair: Miriam Waligora, Brazil

21 October 2014 09:00 - 12:00

| Start | End | Topic | Speakers |
|---|---|---|---|
| 09:00 | 09:05 | Workshop Presentation | • Miriam Waligora |
| 09:05 | 09:25 | Critical urological points in the pregnant paraplegic/tetraplegic .Use of medications. | • Milton Borreli Jr |
| 09:25 | 09:45 | Bowel management and care in the paraplegic/tetraplegic pregnant woman | • Paulo Carvalho |
| 09:45 | 10:05 | Impact of pregnancy over previous incontinence surgery | • Virginia Roncatti |
| 10:05 | 10:30 | Questions | All |
| 10:30 | 11:00 | Break | None |
| 11:00 | 11:20 | Pregnancy and Delivery in the paraplegic/tetraplegic . What to expect. | • Miriam Waligora |
| 11:20 | 12:00 | Case Presentation | All |

## Aims of course/workshop

The workshop fills an important gap bringing the experience of the faculty in following paraplegic/tetraplegic patients during pregnancy and the specific measures to take for delivery as well as how to best prevent urinary tract complications. It aims to give the audience the tools to give support for the patients' fears and focus the care on the real risk areas: infection, sphincter care, thromboembolism prevention and risk associated with sensibility/mobility limitations.

Workshop 27 ICS 2014

Workshop Presentation 9:00- 9:05 Dra.Miriam Waligora

Why this Workshop?

Growing incidence of Adult Women with neurological compromising due to:
Better survival from car acidentes
Growing incidence of sports acidentes
Succesfull treatments for neurological tumours
(technology applied to medecine allows us to early diagnose and treat tumours with good survival )

Conditions for social and professional inclusion of women with neurological condiitons (every company has a % of handicaped workers, adaptation of buildings and cities)

Lack of large series and no referral centers for obstetrics/neurology or neurology applied to obstetrics /delivery

Paraplegic/tethraplegic women getting to addult age and willing to be mothers

Objectives: to clear out miths, contributing for self assureness for doctors and patients concerning pregnancy possibilities and outcome.
To attract professionals interested in the subject in order to start an international data base and exchange of experience

# Tratamento Medicamentoso durante a Gestação em Pacientes com Lesão Medular

Milton Borrelli Júnior
Hospital Israelita Albert Einstein

ITU
Bexiga Hiperativa
Tromboembolismo
Disrreflexia Autonômica
Espasticidade
Obstipação
Úlceras de Pressão
Insuficiência Respiratória

## ITU

35 - 38%

Pereira L . 2003 . *Obstetric management of the patient with spinal cord injury* . Obstetrical and Gynecological Survey 58 : 678 – 687 .

Wanner MB, Rageth CJ, Zach GA. *Pregnancy and autonomic hyperreflexia in patients with spinal cord lesions*. Paraplegia 1987;25:482–490.

## Penicilinas

Têm sido amplamente utilizadas durante a gravidez:

-benzilpenicilinas

-ampicilina

-amoxicilina

- há redução da concentração sérica dessas penicilinas durante a gravidez - doses mais altas que as usuais talvez sejam necessárias quando administrados nesse período

- improvável que alguma delas seja teratogênica.

- concentração no leite: 2 a 20% da concentração sérica. Não deve modificar a indicação de aleitamento materno.

## Cefalosporinas

Várias cefalosporinas de primeira geração (cefadroxil, cefalotina e cefazolina, por exemplo) têm sido estudadas em gestantes.

-têm sido utilizadas como drogas de escolha no tratamento de ITU.

-as cefalosporinas de terceira geração e de quarta geração são provavelmente seguras durante a gestação

-improvável que alguma delas seja teratogênica.

-sua administração à nutriz não impede a continuidade da amamentação, admitindo-se a possibilidade de não ocorrerem efeitos adversos significativos no lactente.

## Aztreonam e Imipenem

São antimicrobianos beta-lactâmicos e, provavelmente, isentos de ação teratogênica:

- o aztreonam, pertencente à classe dos monobactâmicos;
- o imipenem, à classe dos carbapenens.

- até o presente não foram realizados estudos com o emprego de imipenem/cilastatina durante a gravidez humana, desconhecendo-se também a proporção em que é eliminado no leite materno.

- o uso desse antimicrobiano durante a gravidez deve ser feito com cautela, devendo apenas ser prescrito quando a indicação for muito bem fundamentada.

- a amamentação deve ser interrompida quando o imipenem for utilizado no período pós-natal.

## Polimixinas

As polimixinas atravessam a barreira placentária atingindo concentração terapêutica no feto.
Não há referência sobre os efeitos nocivos fetais. Porém, a utilização das polimixinas está associada à insuficiência renal, neurotoxicidade e ototoxicidade.

## Cloranfenicol

Não se recomenda, em geral, o emprego do cloranfenicol durante a gravidez.

- cloranfenicol é pouco metabolizado pelo recém-nascido (deficiência da enzima hepática responsável por sua conjugação) e pode alcançar elevada concentração sérica.
- Podem ocorrer manifestações como: Síndrome cinzenta (palidez, cianose, distensão abdominal, colapso circulatório e morte) e/ou idiossincrasia hematológica (aplasia medular).

Embora os eventos referidos não tenham sido observados em recém-nascidos de mães que receberam cloranfenicol no terceiro trimestre da gestação ou durante o período de aleitamento materno, deve prevalecer a norma de limitar ao máximo a utilização desse antimicrobiano durante o ciclo gravídico-puerperal, aceitando-se sua indicação apenas quando não há outra opção terapêutica.
Quanto ao aleitamento materno, há dados concretos que o autorizem.

## Aminoglicosídeos

Durante a gravidez encontra-se diminuída a concentração sérica de:

Gentamicina; amicacina; canamicina.

Estudo realizado demonstrou que 40% das gestantes necessitaram dose de gentamicina duas vezes maior em relação à recomendada, para que fossem alcançados níveis séricos terapêuticos.

Há relato de lesão do oitavo par craniano em crianças cujas mães receberam estreptomicina, em tratamento prolongado para tuberculose.

Em relação à canamicina, amicacina, gentamicina e tobramicina não há relato da ocorrência de lesão similar; contudo, como o potencial tóxico está presente, o uso desses aminoglicosídeos durante a gravidez está contra-indicado, a menos que não haja alternativa terapêutica.

Pequena quantidade dos aminoglicosídeos é excretada no leite materno. Como não são absorvidos no tubo digestivo do lactente, não há nenhum motivo para suspender a amamentação, quando a mãe for tratada com qualquer antimicrobiano desse grupo.

## Macrolídeos

(eritromicina, azitromicina, claritromicina, roxitromicina)

- estearato de eritromicina tem sido administrada sem restrições a gestantes alérgicas à penicilina, no tratamento da sífilis.

Com as doses terapêuticas usuais, concentrações séricas muito baixas são encontradas na circulação fetal.

- estolato de eritromicina, que pode causar colestase, deve ser evitado durante a gravidez e ser substituído pelo estearato.

A excreção da eritromicina no leite materno é relativamente elevada, sem proporcionar, no entanto, uma concentração que exija suspensão da amamentação.

A azitromicina é mais segura que a claritromicina durante a gestação. Estudos em animais não mostraram risco de teratogenicidade com o uso da azitromicina. A claritromicina mostrou toxicidade em animais, entretanto o benefício do uso pode exceder o risco em algumas situações.

## Tetraciclinas

Ligando-se firmemente às estruturas dentárias e aos ossos em desenvolvimento, as tetraciclinas podem causar várias alterações nesses tecidos. Estão demonstradas desde alterações da coloração dos dentes até hipoplasia da dentina.

Outra importante justificativa para evitar seu uso durante a gravidez relaciona-se ao risco de determinados efeitos tóxicos, tais como necrose gordurosa aguda do fígado, pancreatite e lesão renal. Seu efeito hepatotóxico pode, inclusive, determinar a morte da gestante.

As concentrações das tetraciclinas no leite materno são semelhantes às concentrações séricas, com ingestão de quantidades significativamente altas pelo lactente. Contudo, esses antimicrobianos são quelados pelo cálcio contido no leite materno e, provavelmente, não são absorvidos no tubo digestivo da criança que está recebendo aleitamento materno. Apesar disso, é preferível contra-indicar a administração de tetraciclina a mulheres que estão amamentando.

## Sulfametoxazol + trimetoprima

A trimetoprima é uma droga pirimidínica com propriedades semelhantes às da pirimetamina.

O uso de sulfametoxazol-trimetoprima no início da gestação traz o risco potencial de teratogênese.
O sulfametoxazol apresenta os mesmos riscos de efeitos nocivos fetais das demais sulfas, sobretudo no final da gravidez. Em animais de laboratório, o uso desta associação em altas doses pode provocar defeitos congênitos, especialmente fenda palatina.

Embora não se conheçam efeitos nocivos desta associação em mulheres grávidas, é recomendável evitar seu emprego durante a gravidez, sobretudo durante o primeiro e o terceiro trimestres. São exceções as situações clínicas nas quais o benefício do uso ultrapassa o risco potencial dos efeitos adversos para o feto, tais como a pneumocistose.

## Fluoroquinolonas

As fluoroquinolonas constituem uma classe de agentes antimicrobianos estruturalmente relacionados com o ácido nalidíxico. Administradas em cães imaturos, em dose seis vezes superior às doses habitualmente utilizadas em seres humanos, durante períodos prolongados, as fluoroquinolonas induziram erosões em cartilagens de articulações que suportam peso, provocando lesões articulares permanentes.

Embora tenham sido relatados casos esporádicos de artralgias em pacientes tratados com todas as quinolonas, esse efeito é transitório, e não foram observadas alterações articulares permanentes em adultos.

A preocupação, quanto à possível lesão articular induzida pelas fluoroquinolonas, constitui a razão de contra-indicar esses antimicrobianos a gestantes e a crianças.

## Metronidazol

O metronidazol, utilizado em altas doses e por tempo prolongado, é carcinogênico para ratos e camundongos. Porém, sua utilização na espécie humana não tem demonstrado efeitos adversos desta natureza. Os estudos teratológicos realizados em animais não mostraram ação nociva da droga e, seu uso em mulheres gestantes, não tem sido acompanhado de aumento de defeitos congênitos. Este quimioterápico atravessa a placenta e penetra, eficazmente, na circulação fetal; entretanto, devido ao potencial risco de efeito nocivo, seu uso durante a gestação deve ter indicação precisa, não sendo recomendável sua utilização no primeiro trimestre.

Antifúngicos

Anfoterecina B

BEXIGA HIPERATIVA

Antagonistas muscarínicos

Toxina Botulínica

Eletroestimulação

Neuromodulação

TROMBOEMBOLISMO

Heparinas

DISRREFLEXIA AUTONÔMICA

Prevenção:

Tratar obstipação, cateterismo intermitente com horários rígidos, prevenção das úlceras de decúbito, exame clínico em posição semi-sentada.

Pacientes com LM devem ser referenciadas a um anestesista previamente ao parto para um bom planejamento do parto.

Exames endoscópicos devem ser realizados sob anestesia regional.

O uso de terapia profilática antiipertensiva pode ser utilizada com Nifedipina de 10 a 20mg.

Pacientes com crises frequentes podem se benificiar com o uso de Terazosin a noite de 1 a 10mg.

## ESPASTICIDADE

## Bacoflen

## OBSTIPAÇÃO

Pacientes com LM apresentam incidência aumentada de constipação.

Os pacientes devem:

1. fazer uso de laxantes naturais
2. manter dieta rica em fibrase.

Constipação pode causar Disrreflexia Autonômica.

## ÚLCERAS de PRESSÃO

Úlceras de Decúbito ocorrem com frequencia em pacientes com LM.

Fatores:
Ganho de peso, imobilidade, edema, uso de cadeiras e assentos inapropriados.

As úlceras podem resultar em sepsis e desencadear Disrreflexia Autonômica.

Prevenção:
Exames de rotina da pele, mudanças de decúbito frequentes, e adequação das cadeiras de rodas com o evoluir da gestação.

# INSUFICIÊNCIA RESPIRATÓRIA

Alterações da função pulmonar podem ocorrer em pacientes com lesões torácicas altas (geralmente acima de T5) e cervicais.

Nestas pacientes é fundamental suporte ventilatório e assistência fisioterápica.

(especialmente se a capacidade vital for menor que 13 mL/kg)

Greenspoon JS, Paul RH. Paraplegia and quadriplegia: spe- cial considerations during pregnancy and labor and delivery. Am J Obstet Gynecol 1986;155:738–741.

# Bowel Management and Care in Paraplegic and Tetraplegic Patients

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São Paulo - SP

Junho de 2014

**Introduction**

When occurs damages to nervous system, brain or spinal cord, some alterations will apear on large bowel and fecal continence. This handout will be about management neurogenic bowel dysfunctions (NBD) after spinal cord injury (SCI).

Neurogenic bowel dysfunction corresponds to the disorders of the colum such as constipation, fecal incontinence and abnormal defecation due to loss of normal sensory and or motor control or both (Chung & Emmanuel, 2006), as a result of central neurological disease or injury. Damage to de spinal cord and brain interrupts the neural pathways and the outcome will vary depending on the location and severity of the damage. Neurogenic function may be reflex, areflexic or mixed.

After a complete spinal cord injury the descending input from the brain to the colon and ano-rectum is lost. These changes result in the loss of sensation of the need for defaecation, loss of voluntary control of defaecation and loss of the brain's influence over reflex activity.

The enteric nervous system, which lies within the walls of the colon, remains functionally intact. Therefore peristalsis continues, but without the co-ordination from the brain and spinal cord it is less effective, and colonic transit time will increase

considerably, resulting in a drier stool and an increased likelihood of constipation. Other effects on the bowel depend on the part of the spinal cord that is damaged. When spinal shock has resolved, one of two types of neurogenic bowel may develop.

Injuries to the twelfth thoracic vertebra (T12) result in damage to upper motor neurons (lying within the spinal cord) leaving the reflex arc from the cord to the colon and ano-rectum intact. This remaining reflex activity can be utilised for effective bowel management. By stimulating the rectum the bowel may push faeces from the rectum through reflex contraction, reducing the need for aperients or manual evacuation.

Injuries to the first lumbar vertebra (LI) and below result in a flaccid bowel with a lax anal sphincter and pelvic floor. Injuries at this level damage the reflex arcs between the spinal cord and the colon and ano-rectum and the reflex activity of the bowel is lost. This results in slow stool propulsion through the descending and sigmoid colon and a high risk of fecal incontinence through the lax anal sphincter.

Where the SCI is incomplete remaining bowel function may not fit neatly into these definitions. It is important therefore to base bowel management on individual assessment.

Clinical Presentations in Bowel Functions Following SCI (Singal et al. 2006)

| | Upper Motor Neuron lesion | Lower Motor Neuron lesion |
|---|---|---|
| Level | > T10 vertebral or T12 spinal segment | < T10 or T12 spinal segment |
| Time from cecum to anus | ⇧ | ⇧ |
| Motility on left colon | ⇩ | ⇩ |
| External anal sphincter | Spastic paralysis | Flaccid paralysis |
| Sympathetic output | Absent with lesions > T6 spinal segment | Retained |
| symptoms | Constipation<br>Dificulty with evacuation<br>Incontinence | Constipation<br>Dificulty with evacuation<br>Incontinence |
| Fecal impactation | Proximal colon | Rectal |

| | | |
|---|---|---|
| Autonomic dysreflexia | Common | Rare |
| Reflex defecation | Present | Not known |

**Aims of Bowel Management at SCI**

The changes in bowel function following SCI mean that there is a need to actively manage the bowel and the fecal continence. Thus the main aims include:

- achieve regular and predictable emptying of the bowel at a socially acceptable time and place, without fear of feacal incontinece;
- complete bowel management within a reasonable time, that is, up to one hour (Stone et al., 1990);
- minimize or avoid constipation, fecal incontinence and autonomic dysreflexia;
- evaluate the outcomes and modify the program during the long-term management;
- use minimum necessary physical or pharmacological interventions;
- maintain short and long-term gastrointestinal health avoiding others complicatios such as diarrhoea and bleeding;
- enable the SCI patient through training to control of his bowel function, independently or through a carer, and to promote his reintegration into society.

**Interventions used for Bowel Management**

The bowel management after spinal cord injury is based on regular routine aiming to increase continence control and avoid constipation. However, the interventions must be individualized according to the type of lesion and their different

manifestations, frequently evaluated during the clinical follow up. The main interventions include (Coggrave, 2012):

**Physical activity**

Physical activity helps to promote peristalsis in the colon, which in turn helps to keep stools moving. SCI individuals should carry out as much of their own care as possible, such as transferring and pushing, bathing and dressing, as these activities help to provide daily exercise, thereby helping to move the stool through the colon and avoid constipation. Other activities such as passive movements, stretching and using a standing frame can also be beneficial.

Where an individual is able to transfer or use a hoist it is generally more effective to sit upright on a padded toilet seat, commode or shower chair in order to manage his bowels. Peristaltic activity is greater when sitting upright and gravity can aid the expulsion of stool from the rectum.

**Diet and fluid intake**

It is important to eat a balanced diet which is rich in fruit, vegetables, bread and cereals, to ensure an adequate fibre intake. Fibre holds water and adds bulk to the stool, which aids the movement of the stool through the bowel. Excessive amounts of fibre should, however, be avoided and raw bran is no longer recommended. Diet should also contain a moderate amount of dairy products, meat, fish or pulses. Foods containing fats and sugars should only be consumed in small amounts.

It is also essential to have an adequate daily fluid intake in order to avoid constipation. The body should be well hydrated in order to prevent too much absorption

of water by the colon, which results in a hard, dry stool. A fluid intake of atleast 2 litres daily is recommended made up mostly of water.

**Gastro-colic reflex and ano-rectal stimulation**

Eating and drinking initiates peristalsis throughout the digestive system thus moving stool through the colon towards the rectum. This is called the gastro-colic reflex. It can be beneficial to make use of this reflex and plan to empty the bowel 15 to 30 minutes after a meal or at least a hot drink  after breakfast or the evening meal (Coggrave, 2012).

Ano-rectal stimulation makes use of the remaining reflex activity in individuals with a cervical or thoracic injury by triggering relaxation of the anus and peristalsis in the lower colon and the rectum.

This is achieved by the insertion of a gloved, lubricated finger into the anus followed by a gentle circular motion of the finger until relaxation of the internal sphincter (Stiens, 1997). The finger is then removed to allow the reflex contractions to move stool down into the rectum from where it is expelled. This stimulation can be repeated every 5-10 minutes, until the bowel has emptied and no more stool can be felt in the rectum. Stimulation more than 2 or 3 times is not usually necessary but the needs of the individual and their responsiveness to the technique should determine how many times stimulation is conducted.

The strength of reflex contractions can vary greatly from one individual to another and in many cases may not produce a complete emptying of the rectum. In this case it will be necessary to carry out a manual evacuation of the remaining stool.

**Abdominal massage**

In the literature the use of abdominal massage has been reported by 22-30% of individuals with neurogenic bowel dysfunction (Coggrave et al., 2008; Han et al., 1998). Physiological studies have showed that massage produces a measurable response in the rectum and anus (Coggrave et al., 2007).

Massage may be used before and after digital rectal stimulation, insertion of stimulants or digital removal of faeces to aid evacuation (Coggrave, 2005), relieving constipation by stimulating peristalsis, decreasing colonic transit time and increasing the frequency of bowel movements.

**Oral and rectal laxatives**

The use of oral laxatives is reported in 60% of SCI patients (Coggrave et al 2008); however, the efficacy of laxatives in neurogenic bowel management remains still known (Coggrave, 2012). The principal oral laxatives include: stimulants (e.g. senna, bisacodyl), softeners (dioctyl), and osmotic (lactulose, polyethylene glycol). Use of these drugs is associated with fecal incontinence. Therefore, individualised assessment is essential.

Rectal stimulants (suppositories and enemas) are used to trigger evacuation of the bowel at the appropriate time for the individual and are essential to achieving managed continence. Suppositories are reported to be used by between 32-71% of individuals with neurogenic bowel dysfunction (Coggrave et al 2008, Kirk 1997, Correa and Rotter 2000). The main rectal laxatives include: suppository (glycerine and bisacodil) and enemas. Small volume enemas as sodium citrate have been reported to be safe and effective. Large volume phosphate enemas are not recommended due to possible risk of autonomic dysreflexia in susceptible individuals (Ash et al. 2006). Rectal stimulants alone are not sufficient to complete reflex evacuation; most

individuals also require digital stimulation or digital evacuation of stool (Coggrave et al., 2008).

**Prokinetic agentes**

Prokinetic agents are prucalpopride, cisapride, metoclopramide, neostigmine and famprimine.

Studies with prucalopride (seletive serotonina receptor agonist that have enteroknetic proterties) compared with placebo, showed an improvement inaverege weekly frequency of all bowel moviments. The results were bether with 2 mg/day (Krogh et al. 2002). Cisapride reduces the colonic transit time (Gerder et al. 1995). Metoclopramide reduces the gastric empatying and colonic time transit (Segal et al. 1987). Neostigmine improves bowel evacuation (Korsten et al. 2005). Fampridine increase the number of days with bowel moviments (Cardenas et al. 2007). They all can be used for the treatment of chronic cosntipation in persons with SCI.

**Digital stimulation and removal**

Use of digital rectal stimulation is reported in 35–50% of individuals with neurogenic bowel dysfunction after SCI (Coggrave et al 2008, Correa and Rotter 2000). Digital rectal stimulation is a technique used to increase reflex muscular activity in the rectum thereby raising rectal pressure to aid in expelling stool, and to relax the external anal sphincter, thus reducing outlet resistance (Korsten et al 2007, Coggrave 2005, 2007, 2008).

Digital removal of stool involves the use of a single finger to remove stool from the bowel to avoid incontinence or impaction of faeces, occasionally when other methods have failed, or as part of routine bowel management.

It may be used to break up a hard constipated stool in the rectum to promote evacuation, or to remove stool prior to the insertion of a suppository/micro enema against the rectal mucosa for reflex bowel care (Consortium for spinal cord medicine, 1998). It may be used by individuals with new SCI of any level, where all other physical stimulation and oral/rectal laxatives have failed to produce emptying of the rectum (Addison, 1995; Correa & Rotter, 2000) and by individuals with chronic SCI where manual evacuation forms an established part of their bowel management routine.

**Transanal irrigation**

Transanal irrigation of the bowel can be defined as a process of facilitating evacuation of faeces from the rectum and descending colon by passing water into the bowel via the anus in a quantity sufficient to reach beyond the rectum. Two recent reviews (Christensen 2010, Emmanuel 2010) have suggested that in individuals with chronic neurogenic bowel dysfunction, irrigation outperforms more conservative methods reducing fecal incontinence and constipation, improving quality of life.

**Antegrade continence enema**

The ACE is a continent catheterisable stoma formed surgically from the appendix or caecum, giving access to the colon for administration of enema or irrigation for bowel management. The ACE procedure may reduce the duration of bowel care and incidence of fecal incontinence (Teichman et al., 1998 & 2003, Christensen et al., 2000).

**Nerve stimulation**

The sacral stimulation has been available for several decades and though usually implanted primarily for bladder management problems after spinal cord injury it has been reported to have a very beneficial effect on bowel management for many individuals. The implantation of sacral roots electrodes (S1-S3) with rhizotomy at the conus medularis, This program resulted in quality of life regarding dependence, socialization and sense of control and elimination of autonomic dysreflexia (Kachourbos and Creasey 2000).

**Electrical or Magnetic stimulation**

Some equipments of electrical or magnetic stimulation methods have been developed and tested to improve bowel function. Neuromuscular electrical stimulation (NMES), tryed to stimulate the abdominal surface, and the result was an accelerated colonic transit in the ascending, tranverse, and descending colon in all patients who received treatment (Hascakova-Bartova et al. 2008). Functional magnetic stimulation, directly abdominal wall, improves the colonic transit from 62.6h para 50.4 h (Tsai et al. 2009).

**Eletroacupuncture**

Studies showed that this treatment may provide an alternative tool in improving patients self controlled bowel and bladder functions. And more studies must to be done (Liu et al. 2013)

**Colostomy**

Stoma irrigation can be employed to give effective control over stoma function but is underutilised in both the neurogenic and non neurogenic colostomy populations. The formation of a colostomy has been seen until recently as a last resort when dealing with neurogenic bowel dysfunction, and even as a failure of rehabilitation services (Randell et al 2001). However, a number of studies have found that the formation of a stoma can greatly improve quality of life for some individuals ( Coggrave et al 2012, Rosito et al 2002).

The formation of a colostomy has been seen until recently as a last resort when dealing with neurogenic bowel dysfunction, and even as a failure of rehabilitation services (Randell et al 2001). However, a number of studies have found that the formation of a stoma can greatly improve quality of life for some individuals (Coggrave et al 2012, Rosito et al 2002).

**Clinical Outcomes and Complications**

Neurogenic bowel dysfunction can present complications such as reduced life quality, fecal incontinence, constipation, fecal impaction, hemorrhoids, megacolon/megarectum, rectal prolapse, anal fissure and autonomic dysreflexia.

**Reduced quality of life**

Delisa & Kirshblum (1997) suggest that establishing an effective bowel program is critical because incontinence may interfere with a patient's physical, psychological, social, recreational and sexual function. The effects of neurogenic bowel dysfunction on the quality of life in this population are widely acknowledged and

include loss of independence and social isolation (Emmanuel, 2010; Correa & Rotter, 2000).

### Fecal incontinence

Fecal incontinence is defined by the International Consultation on Incontinence as "the involuntary loss of flatus, liquid or solid stool that is a social or hygienic problem" (Norton et al., 2009). About 75% of individuals with spinal cord injury report fecal incontinence. Contamination from stool may lead to an increase in urinary tract infections and cause damage to skin either directly or due to wearing pads.

### Constipation

Constipation is associated with rectal and abdominal pain, painful defecation, difficulty with evacuation, straining at stool, bloating, prolonged evacuation, fecal incontinence and a sensation of incomplete evacuation. Constipation is common in neurogenic bowel dysfunction, reported by 39-58% of individuals with SCI (Coggrave, 2009).

### Fecal impaction

Symptoms may include absent or reduced evacuation of stool for a longer period than usual for the individual, abdominal bloating or distention, nausea and pain. Impaction may be accompanied by intensive diarrhoea where looser stool leaks around an unmoving fecal mass, often associated with fecal soiling. Impaction in individuals with compromised respiratory function as in high level SCI may result in breathlessness due to reduced diaphragmatic excursion. Susceptible individuals may show symptoms of sub-acute autonomic dysreflexia.

### Hemorrhoids

Haemorrhoids present with bright red blood on the stool or toilet paper, or the gloved finger after evacuation or digital rectal stimulation, and may cause pain, itching and autonomic dysreflexic symptoms in individuals with SCI above the sixth thoracic vertebra. They are common in individuals with neurogenic bowel dysfunction reported by approximately 40% of individuals with SCI (Coggrave, 2009).

### Megacolon/megarectum

It is associated with older age (greater than 50 years), longer duration of spinal injury (10 years or longer) and symptoms of abdominal distension, pain and constipation, use of multiple laxatives, anticholinergic medication and use of calciumcontaining antacids. Colostomy may be considered where these complications result in recurrent hospitalisations (Harrari & Minaker, 2000).

### Rectal prolapse

This term refers to one of three entities: fullthickness rectal prolapse where the full-thickness of the bowel wall protrudes through the anus; mucosal prolapse where only the mucosa protrudes; or internal prolapse or intussusception where the collapsed tissue “telescopes” on itself but remains within the colon. The individual may report a mass protruding from the anus after evacuation which may retract spontaneously or require reduction manually.

### Anal fissure

A linear ulcer in the skin lining in the anal canal (Gordon & Nivatvongs, 2007). The individual's bowel management should be evaluated to ensure that constipation is eradicated and that digital interventions are used properly.

**Autonomic Dysreflexia**

Autonomic dysreflexia is an abnormal sympathetic nervous system response to a noxious stimulus below the level of injury in individuals with SCI above the sixth thoracic vertebra. Among susceptible patients, 36% report dysreflexic symptoms occasionally and 9% always when they conduct bowel management (Coggrave et al., 2008).

**Conclusion**

Bowel management includes a comprehensive evaluation of bowel function (patient history, physical exam, organic apresentation of SCI), the development of a bowel management program, an assessment of the ability of the individual or his caregiver to perform procedures safely and effectively; and continuous treatment program review.

Establishing an effective bowel management programme after spinal cord injury is essential for the future well being of each individual. If this is not achieved there is a likelihood of fecal incontinence, which will interfere with an individual's physical, psychological, social, recreational and sexual function. Many spinal cord injured pacients have said that after loss of mobility, loss of bowel control is the next most distressing aspect of SCI. The aim is not only to ensure adequate bowel emptying but to achieve control over bowel function.

**References**

Addison R (1995): Digital rectal examination and manual removal of faeces; the role of the nurse. London, RCN.

Ash D, Harrison P, Slater W (2006): Bowel management. In Harrison P (ed) Managing spinal cord injury: continuing care. Spinal Injuries Association, Milton Keynes.

Cardenas DD, Ditunno J, Graziani V, Jackson AB, Lammertse D, Potter P, Sipski M, Cohen R, Blight AR. Phase 2 trial of sustained-release fampridine in chronic spinal cord injury. Spinal Cord 2007; 45: 158-168.

Christensen P, Krogh K. (2010): Transanal irrigation for disordered defecation: a systematic review. Scand J Gastroenterol. 2010 May;45(5):517-27.

Chung EA, Emmanuel AV. Gastrointestinal symptoms related to autonomic dysfunction following spinal cord injury. Prog Brain Res 2006;152:317-33.

Coggrave M, Norton C, Cody JD. Management of fecal incontinence and constipation in adults with central neurological diseases. Cochrane Database Syst Rev. 2014 Jan 13;1:CD002115

Coggrave M, Norton C, Wilson-Barnett J. 2009: Management of neurogenic bowel dysfunction in the community after spinal cord injury: a postal survey in the United Kingdom. Spinal Cord. 47(4):323-330 Korsten M, Singal A, Monga A et al (2007): Anorectal Stimulation Causes Increased Colonic Motor Activity in Subjects With Spinal Cord Injury. J Spinal Cord Med; 30(1): 31–35.

Coggrave M. Guidelines for management of neurogenic bowel dysfunction in individuals with central neurological conditions. Multidisciplinary Association of Spinal Cord Injured Professionals; 2012.

Coggrave M. Management of the neurogenic bowel. Br J Neurosci Nurs 2005;1(1):6-13.

Coggrave M. Neurogenic bowel management in chronic spinal cord injury: evidence for nursing care. Unpublished PhD, King's College, London. 2007.

Coggrave M. Neurogenic continence. Part 3: bowel management strategies. Br J Nurs 2008;7(11):706-710. Cord injury: clinical evaluation and rehabilitative management. Arch Phys Med.

Correa G, Rotter K: Clinical evaluation and management of the neurogenic bowel after spinal cord injury. Spinal Cord. 38,5,301-308.

Geders JM, Gaing A, Bauman WA, Korsten MA. The effect of cisapride on segmental colonic transit time in patients with spinal cord injury. Am.J.Gastroenterol 1995; 90: 285-289.

Gordon P.H. AND Nivatvongs, S. (2007): eds. Colon, rectum and anus. 3rd ed. NewYork, Informa Healthcare

Han RR, Kim JH, Kwon BS. Chronic gastrointestinal problems and bowel dysfunction in patients with spinal cord injury. Spinal Cord 1998;36:485-490.

Harari, D. & Minaker, K. (2000): Megacolon in patients with chronic spinal cord injury. Spinal Cord. 38 6, 331-339 Rehabil 1997;78(3 Suppl):S86-102.

Hascakova-Bartova R, Dinant J-F, Parent A, Ventura M. Neuromuscular electrical stimulation of completely paralyzed abdominal muscles in spinal cord-injured patients: a pilot study. Spinal Cord 2008; 46: 445-450.

Keating GM. Prucalopride: a review of its use in the management of chronic constipation. Drugs. 2013 Nov;73(17):1935-50.

Korsten MA, Rosman AS, Ng A, Cavusoglu E, Spungen AM, Radulovic M, Wecht J, Bauman WA. Infusion of neostigmine-glycopyrrolate for bowel evacuation in persons with spinal cord injury. Am J Gastroenterol 2005; 100: 1560-1565.

Krassioukov A, Eng JJ, Claxton G, Sakakibara BM, Shum S. Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. Spinal Cord. 2010 Oct;48(10):718-33. doi: 10.1038/sc.2010.14.

Krogh K, Jensen MB, Gandrup P, Laurberg S, Nilsson J, Kerstens R, De Pauw M. Efficacy and tolerability of prucalopride in patients with constipation due to spinal cord injury. Scand J Gastroenterol. 2002 Apr;37(4):431-6.

Liu Z, Wang W, Wu J, Zhou K, Liu B. Electroacupuncture improves bladder and bowel function in patients with traumatic spinal cord injury: results from a prospective observational study. Evid Based Complement Alternat Med. 2013; 2013:543174.

Rosito, O., Nino-Murcia, M., Wolfe, V., Kiratli, B., & Perkash, I. (2002): .The effects of colostomy on the quality of life in patients with spinal cord injury: a retrospective analysis. Journal of Spinal Cord Medicine. 25 3, 174-183.

Segal JL, Milne N, Brunnemann SR, Lyons KP. Metoclopramide-induced normalization of impaired gastric emptying in spinal cord injury. Am J Gastroenterol 1987; 82: 1143-1148.

Singal AK, Rosman AS, Bauman WA, Korsten MA. Recent concepts in the management of bowel problems after spinal cord injury. Adv Med Sci. 2006;51:15 22.

Stiens SA, Bergman SB, Goetz LL. Neurogenic bowel dysfunction after spinal

Stone JM, Wolfe VA, Nino-Murcia M, Perkash I. Colostomy as treatment for complications of spinal cord injury. Arch Phys Med Rehabil 1990;71(7):514-8.

Teichman, J. M., Barber, D. B., Rogenes, V. J., & Harris, J. M. (1998): Malone antegrade continence enemas for autonomic dysreflexia secondary to neurogenic bowel. The Journal of Spinal Cord Medicine. 21 3, 245-247.

Tsai PY. Wang CP, Chiu FY, Tsai YA, Chang YC, Chuang TY. Efficacy of functional magnetic stimulation in neurogenic bowel dysfunction after spinal cord injury. J Rehabil Med 2009; 41: 41- 47.

# Impact of pregnancy over previous incontinence surgery

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- Pregnancy after a preceding incontinence operation is rare and makes it quite difficult to formulate guidelines about delivery when a pregnancy occurs
- The best advice is to postpone incontinence surgery until after the last pregnancy

R Groenen,2007,G W Davila,2012

- Parity and especially the first delivery contributed most to the development of stress urinary incontinence
- The association is strongest in the age group 20 to 34 years with a relative risk of 2.2

G Rotivert, 2001

- It may not be surprising that treatment for incontinence is often requested at a relatively young age when the potential of childbearing is not completed
- So, what king of antincontinence procedure?
- What king of delivery?

- Pregnancy and delivery after mid-urethral sling procedures for stress urinary incontinence: case reports and a review of literature
- Rian Groenen & M. Caroline Vos & Christine Willekes & Harry A. M. Vervest, 2007

**Table 1** Pregnancy and mode of delivery after mid-urethral slings, case reports in literature

| Author(s) | Age | Gravida/ Para | Type of incontinence surgery | Moment of surgery | Continence status during pregnancy | Mode of delivery | Continence after delivery |
|---|---|---|---|---|---|---|---|
| Iskander et al. [21] | 34 | 3/2 | TVT | 9 months before third pregnancy | Continent | Caesarean section at 38 weeks of gestation | Continent after 6 months |
| Lynch et al. [22] | 26 | 3/2 | Vesica suburethral sling | 1 month before third pregnancy | Continent[a] | Caesarean section at 37 weeks of gestation | Recurrence of incontinence after 3 months |
| Gauruder-Burmester and Tunn [23] | 39 | 5/4 | TVT | 3 months before sixth pregnancy | Continent | Caesarean section at 37 weeks of gestation | Continent after 2 months |
| Seeger et al. [5] | 37 | 2/1 | TVT | 1 month before second pregnancy | Unknown | Spontaneous delivery at 40 weeks of gestation | Continent after 5 months |
| Vella et al. [24] | 42 | 2/1 | TVT | 3 years before second pregnancy | Continent | Spontaneous delivery at 40 weeks of gestation | Continent after 2 years |
| Vella et al. [24] | 42 | 3/2 | TVT | 4 years before third pregnancy | Continent | Caesarean section at 38+4 weeks of gestation | Continent after 3 years |
| Hassan et al. [25] | 36 | 2/1 | TOT (Boston Scientific) | At 3 weeks of gestation | Continent | Spontaneous delivery at 39 weeks of gestation | Continent after 2 months |
| Panel et al. [26] | | | 14 case with TVT, TOT, 2 unknown | mean interval 21.9 months | Continent 10; SUI 1; 3 voiding difficulty | Caesarean section in 6; 7 vaginally; 1 ongoing pregnancy | After caesarean section: all 6 continent; |

a Pyelonephritis and intermittent urethral obstruction requiring Foley catheter placement

## Pregnancy and delivery after mid-urethral sling procedures for stress urinary incontinence

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| This study | 28 | 2/1 | TVT | 2 years before second pregnancy | Continent | Caesarean section at 38 weeks of gestation | Urge incontinence, IVS posterior. Continent after 2 years |
| This study | 33 | 5/2 | TVT | 4 months before third pregnancy | SUI | Spontaneous delivery at 35+1 weeks of gestation | SUI, TVT-O. Continent after 13 months |
| This study | 38 | 3/2 | IVS anterior | 5 months before third pregnancy | Continent | Spontaneous delivery at 40 weeks of gestation | Continent |

- 1. Try to complete childbearing before any incontinence surgery.
- 2.If a woman is pregnant after mid-urethral sling surgery, institute conservative treatment during pregnancy.
- 3.Advice vaginal delivery in an otherwise uncomplicated pregnancy irrespective of recurrent incontinence.
- 4. If incontinence occurs or persists postpartum, await spontaneous recovery during at least 6 months up to 1 year
- 5.Repeated mid-urethral sling procedure, if necessary, is most likely safe and effective (not enough data)

## Long-term durability of pubovaginal fascial slings in women who then become pregnant and deliver

Hung-Jui Tan, 2010

**Table 1** Pregnancy and delivery following pubovaginal fascial sling procedure

| Number | Age at procedure | Age at pregnancy | Follow-up post-sling, years | Mode of delivery | Stress incontinence post-procedure | Stress incontinence post-pregnancy |
|---|---|---|---|---|---|---|
| 1 | 32 | 34 | 6 | Vaginal | Continent | Unchanged |
| 2 | 32 | 34 | 8 | Vaginal | Continent | Unchanged |
| 3 | 18 | 22 | 9 | Vaginal | Improved | Unchanged |
| 4 | 33 | 34 | 8 | Vaginal | Improved | Unchanged |
| 5 | 36 | 37 | 1 | Vaginal | Continent | Unchanged |
| 6 | 37 | 40 | 3 | Vaginal | Continent | Unchanged |
| 7 | 41 | 44 | 6 | Vaginal | Incontinent | Decreased |
| 8 | 37 | 38 | 4 | C-section | Continent | Unchanged |
| 9 | 33 | 34 | 4 | C-Section | Improved | Unchanged |

## A case report of antepartum bladder outlet obstruction following transobturator sling placement

D Shveiky, 2010

| Author (year) | Number of cases | Mode of delivery | Continence status |
|---|---|---|---|
| Panel et al. (2008) | 20 | 10 (50%) VD<br>9 (45%) CS<br>1 unknown | 22.2% recurrent SUI |
| El-Ghobashy et al. (2007) | 1 | VD | Continent |
| Vella et al. (2007) | 2 | VD | Continent |
| Demaria et al. (2007) | 1 | VD | Continent |
| Seeger et al. (2006) | 1 | VD | Continent |
| Gauruder-Burmester et al. (2001) | 1 | CS | Continent |

## Conclusion

- Poor database
- Caesarean delivery not necessarily protects against any incontinence

# PREGNANCY AND DELIVERY IN THE PARAPLEGIC/TETHRAPLEGIC.
## WHAT TO EXPECT

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- FIRST OBJECTIVE: TO EDUCATE
- CLEAR THE MITH: THE PREGNANCY OF A NEUROLOGICALLY IMPAIRED WOMAN WILL NOT OBLGATORILLY RESULT IN A HANDICAPED CHILD
- DISSOCIATE: SELFISHNESS FROM DESIRE TO BE A MOTHER



- FOR THE PATIENT
- TO BE SELF ASSURED ABOUT HER POSSIBILITIES
- TO BE AWARE OF HER LIMITATIONS AND RISKS
- ADAPTATION
- COLABORATION:A SPECIAL MOTHER WILL IDEALLY HAVE A SPECIAL PARTNER- WHO IS WITH HER IN THIS JOURNEY?



- FOR THE DOCTOR:
- TIME TO STUDY AND OVERCOME HIS LIMITATIONS
- BARRIERS: INSTALATION,NURSE, LOCATION
- RIGHT DIAGNOSE OF THE ORIGIN AND EXTENSION OF THE LESION



- DON'T BE DISAPPOINTED : BESIDES RISK FOR UTI, TRAUMA,ACCIDENTS, THROMBOEMBOLISM,COMPRESSION ULCERS,AUTONOMIC DYSREFLEXIA,…..
- YOU WILL FIND NO ONE WHO CAN TELL FOR SURE WHAT KIND OF DELIVERY TO PLAN OR TP EXPECT
- MORE EFFORT: TAYLOR MADE DELIVERY



- FOR THE PREGNANCY:
- TEACH THE PATIENT ABOUT SIGNS OF PROBLEMS THAT SHE CAN NOT BE AWARE OF: CONTRACTIONS, BLEEDING , ABNORMAL WETNESS, ULCERS, OEDEMA, THROMBOSIS
- OBSTIPATION AND ADEQUATE BOWEL CARE
- CHANGES IN URINARY PATTERN AND CARE:MANOEUVERS, ISC OR INDWELLING CATHETER
- NUTRITION AND WEIGHT GAIN /OVERWEIGHT AT THE TIME OF CONCEPTION*

PREGNANCY AND DELIVERY IN THE PARAPLEGIC/TETHRAPLEGIC. WHAT TO EXPECT

- FOR THE DELIVERY:
- 1)RESPECT THE INTEGRITY OF MOTHER AND BABY
- 2)TRY TO “MAKE THE DREAM COME TRUE” AS MUCH AS POSSIBLE
- 3)HAVE ELEMENTS FOR ADEQUATE ORIENTATION OF THE TEAM
- 4)TRAINED ASSISTANTS/NURSE
- 5)THE DELIVERY:SENSIBILITY,SPASTICITY,ANESTHESIA

# ICS 44TH ANNUAL MEETING

NEUROGENIC URINARY TRACT DYSFUNCTION AND PREGNANCY

MIRIAM WALIGORA ,M.D.

## NEUROGENIC URINARY TRACT DYSFUNCTION AND PREGNANCY

- CASE PRESENTATION

## NEUROGENIC URINARY TRACT DYSFUNCTION AND PREGNANCY

- CASE 1
- T.D. 24 YO COMPLETE T10 LESION FROM A GUNSHOT
- INITIALLY ON MACRODANTINA AND RECTALLAXATIVES EVERY 2 DAYS + INTERMITENT SELF CATHETERISM
- UTI AT 15 WEEKS PROTEUS
- UTI AT 33 WEEKS E.COLI
- EDEMA +++. DEPRESSION.NO TOXEMIA
- CESAREAN SECTION AT 38 5/7. RN3100 G.

## NEUROGENIC URINARY TRACT DISFUNCTION AND PREGNANCY

- CASE 2
- F.C.C.. 33 YO
- TETHRAPLEGIA -INCOMPLETE C6-C7 CAR ACCIDENT AT 18 YO. QUIT SMOKING AT 33.
- BLADDER EMPTYING BY SUPRA PUBIC STIMULATION + INVOLUNTARY LOSS..BLADDER SENSIBILITY + , URGENCY.BOWEL: WASHING EVERY 2 DAYS.
- TWIN SPONTANEOUS PREGNANCY
- CLEXANE

- BLADDER DIVERTICULUM WITH CALCIFICATIONS
- EDEMA +++,HAEMORROYDS,
- STARTED INTERMITENT CATHTETERISM FOR AUTOOMIC DYSRREFLEXIA FROM 32 WEEKS ON ( BP 190X110)
- FELT VAGINAL WEIGHT SENSATION + UTERINE CONTRACTIONS . VAGINAL EXAMINATION SHOWE CERVICAL DILATATION WITH PALPABLE AMNIOTIC MEMBRANE
- FETAL MONITORING SHOWED LABOUR… C SECTION 3 KG EACH.. GOOD EVOLUTION

## NEUROGENIC URINARY TRACT DISFUNCTION AND PREGNANCY

- CASE 3
- A.S.H..
- OPERATED CAVERNOMA T4 – T5 . BLADDER EMPTYING :SPM. SPASTIC PARAPLEGIA.
- TWO SPONTANEOUS PREGNANCIES
- FIRST 37 3/7WITH LOCAL ANESTHESIA WITH MARCAINA + SEDATION REMIFENTANIL
- SECOND :37 6/7 LOCAL + PROPOFOL