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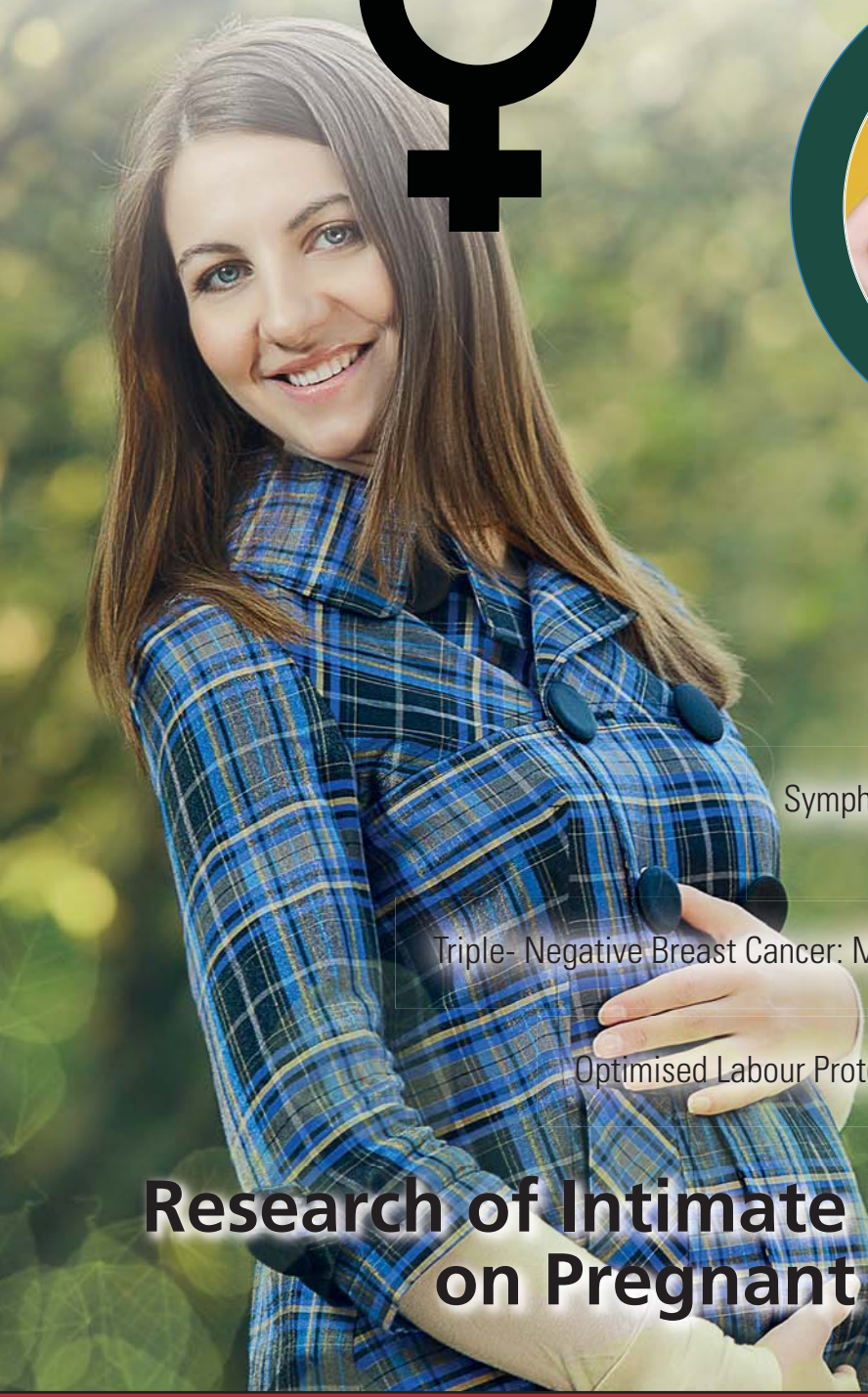

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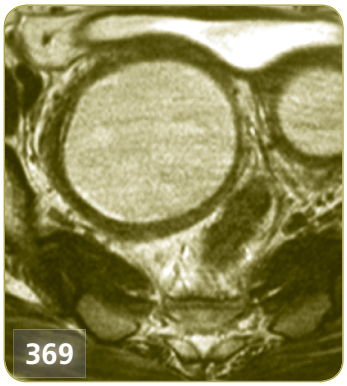

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PAEDIATRICS

Chlorhexidine to the umbilical cord in developing countries

About half of all neonatal deaths around the world are caused by infections, and the umbilicus is regarded as a major point of entry for infective organisms, especially in the rural areas of developing countries where hygiene is often poor. Data from Nepal have suggested that the application of chlorhexidine to the umbilical cord after birth could reduce umbilical infection and neonatal mortality. Now, two studies reported in one issue of the *Lancet*, one in rural Bangladesh and one in rural Pakistan, have confirmed the benefits of cord cleansing with chlorhexidine.

In Bangladesh, a cluster randomized trial included 133 clusters (29,760 neonates) with randomization to one of three options: a single application of chlorhexidine to the cord soon after birth (single cleansing, SC); daily application for 7 days (multiple cleansing, MC); or dry cord care (DC). Neonatal mortality was 22.5 per 1,000 live births (SC), 26.6 per 1,000 (MC), and 28.3 per 1,000 (DC), a significant reduction with SC, but not with MC, compared with DC. The rate of severe cord infection (redness and pus) was 3.3 per 1,000 (SC), 1.2 per 1,000 (MC), and 4.2 per 1,000 (DC), a significant reduction with MC, but not with SC, compared with DC. These researchers conclude that cord cleansing with chlorhexidine is effective, but the optimum frequency of application is to be established.

In rural Pakistan, the study included 187 population clusters and 9,741 neonates. Randomization was to one of four options for infants delivered by traditional birth attendants (TBAs): supply of 4% chlorhexidine solution to be applied to the cord by the TBA at birth and then daily by family members for up to 14 days, and supply of soap for handwashing; supply of chlorhexidine only; supply of soap for handwashing only; or promotion of dry cord care. Chlorhexidine cleansing was associated with a significant 42% reduction in risk of omphalitis compared with dry cord care, but handwashing had no significant effect. Similarly, chlorhexidine was associated with a significant 38% reduction in neonatal mortality, but there was no reduction with handwashing. These researchers conclude that cord cleansing with chlorhexidine is effective and that the provision of chlorhexidine in birth kits might reduce neonatal mortality.

El Arifeen S et al. The effect of cord cleansing with chlorhexidine on neonatal mortality in rural Bangladesh: a community-based, cluster-randomised trial. Lancet 2012; 379: 1022–1028: Soofi S et al. Topical application of chlorhexidine to neonatal umbilical cords for prevention of omphalitis and neonatal mortality in a rural district of Pakistan: a community-based, cluster-randomised trial. Ibid: 1029–1036; Osrin D, Hill ZE. Chlorhexidine cord cleansing to reduce neonatal mortality. Ibid: 984–986 (comment).

Moderate or late preterm birth and health outcomes

The UK Millennium cohort study is a nationally representative prospective cohort study including 18,818 infants born in 2000–2002 and still living in the UK at the age of 9 months. Health outcomes in relation to gestational age at birth were assessed at ages 3 and 5 years and included growth, hospital admissions, longstanding illness, wheezing, use of prescribed drugs, and parental rating of children's health. In general, there was an inverse relationship between gestational age at birth and frequency of adverse health outcomes. The greatest number of such outcomes was among children born at moderate or late preterm (32–36 weeks) or at early term (37–38 weeks). Birth at 32–36 weeks accounted for 5.7% of children with three or more hospital admissions at ages 9 months to 5 years. Birth before 32 weeks accounted for 3.8% of such children and birth at 37–38 weeks for 7.2%. For a limiting longstanding illness, the corresponding population attributable fractions were 5.4% for birth at 32–36 weeks, 2.7% for birth before 32 weeks, and 5.4% for birth at 37–38 weeks.

Modestly preterm birth and early term birth contribute more to the burden of adverse health outcomes than does very preterm birth.

Bryle EM et al. Effects of gestational age at birth on health outcomes at 3 and 5 years of age: population based cohort study. BMJ 2012; 344 (March 17): 17 (e896).

Oral amoxicillin for severe early childhood pneumonia in rural Pakistan

In 2008, pneumonia accounted for 18% of all deaths in children under the age of 5 years. Almost half of all deaths in young children occur in Pakistan, India, China, Nigeria, and the Democratic Republic of the Congo. Delayed treatment is responsible for many child pneumonia deaths, and in 2004, the World Health Organization (WHO) and United Nations Children's Fund recommended antibiotic treatment at home given by trained health workers, instead of hospital referral, for non-severe pneumonia in rural areas. Meta-analyses have confirmed the effectiveness of this policy. Now, a trial in rural Pakistan has shown that the policy is effective for children with severe pneumonia.

A cluster randomized trial in rural Sindh province, Pakistan, included 4,410 children aged 2–59 months with WHO-defined severe pneumonia. The children were screened by lady health workers. Those with severe pneumonia were prescribed oral amoxicillin syrup (45 mg/kg twice daily) for 5 days at home (intervention clusters), or given a single dose of oral co-trimoxazole and referred to the nearest health facility for intravenous antibiotic treatment (control clusters). The children were followed up at 2, 3, 6, and 14 days. Treatment failure by day 6 occurred in 8% (intervention) and 13% (control), a non-significant difference. There were three deaths, two in the intervention group and one in the control group.

Home treatment with oral amoxicillin was at least as effective as current WHO policy for severe pneumonia.

Soofi S et al. Effectiveness of community case management of severe pneumonia with oral amoxicillin in children aged 2–59 months in Matiari district, rural Pakistan: a cluster-randomised controlled trial. Lancet 2012; 379: 729–737; Black RE, El Arifeen S. Community-based treatment of severe childhood pneumonia. Ibid: 692–694 (comment).

Paediatricians influence parental febrile behavior

'Fever phobia' describes an attitude of unreasonable fear that parents may have surrounding fever and treatment for fever in their children. A survey of 388 parents and 480 physicians from Italy showed that physician attitudes towards febrile children can inform how parents handle their child's illness and may be a driving factor in fever phobia.

Parents of children aged 0–6 were given an 18-question multiple choice questionnaire on fever management including the definition of fever based on body temperature, best place to take temperature, potential side effects of fever, drugs used for treatment, and drug administration techniques. The questionnaire was based on previous similar surveys and recent guidelines from the UK and Italy on fever management. Paediatricians were given a similar but terminologically different questionnaire.

The majority of parents (67.8%) said that their paediatrician was their primary source of information on fever and fever management. All parents believed that fever could cause harmful effects like delirium, dehydration, or coma. If left untreated, 89.9% believed that fever could cause brain damage or seizures.

The study highlighted a number of wrong behaviours. In similar ratios, paediatricians and parents said that they use sponging or ice packs to reduce fever (78.5% vs 77.8%; $P = 0.867$), and that they alternated ibuprofen and acetaminophen to treat fever (27% vs 21.4%; $P = 0.953$), despite guideline recommendations. Of concern, 1.4% of paediatricians and 1.2% of parents said that they use acetylsalicylic acid or steroids as a second-choice therapy to antipyretic drugs ($P = 0.937$). Oral antipyretic administration was correctly preferred by 73.1% of paediatricians and 48.7% of parents ($P < 0.0001$), compared with rectal administration.

The similarities between many of the attitudes and practices related to fever demonstrate the degree to which parents follow their paediatrician's lead. Educational programmes aimed at paediatricians could help modify parental behaviours as well.

Chiappini E et al. Parental and medical knowledge and management of fever in Italian pre-school children. BMC Pediatr 2012; 12(1): 97.

Paralytic Conditions in Childhood

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James A Fernandes, FRCS(Ed)(Orth)

CEREBRAL PALSY

Cerebral palsy is a disorder of tone, movement and posture due to a fixed and nonprogressive lesion in the developing brain. The spinal cord and the muscles are structurally and biochemically normal. With growth and development, secondary effects are seen in the muscles, tendons and joints. The motor cortex is predominantly involved and cerebral palsy may be caused by many different prenatal, perinatal and post-natal factors.

Epidemiology and Aetiology

The worldwide incidence of cerebral palsy is 1–7 per 1,000 live births; it is about 3 per 1,000 live births and increasing in the 'developed' world. This increase may be due to the survival of very low birthweight babies and premature infants. The causes and risk factors are shown in Table 1.

Classification

Cerebral palsy can be classified by the neuropathic type of motor dysfunction or by the anatomical region of involvement. (Table 2) Children can also be classified functionally as:

- Independent community ambulators,
- Dependent community ambulators,
- Wheelchair bound.

History

The birth history (including weight, gestational age, complications) is very important. A careful documentation of delays in physical and mental milestones is relevant for prognosis. A review of the relevant systems and previous surgery is necessary.

Table 1. Risk factors and causes of cerebral palsy

Prenatal	Genetic, prematurity, low birthweight, maternal causes (eg, abuse of drugs and alcohol, infection, epilepsy)
Perinatal	Obstetric problems, neonatal asphyxia
Post-natal	Trauma, drowning, suffocation, vascular accidents, meningitis, encephalitis

Physical Examination

Observing the child while taking the history provides clues to diagnosis; the following should be present:

- Head control at 3–4 months
- Sitting by 6 months
- Crawling by 9 months
- Standing and cruising by 10–12 months
- Walking between 12 months and 18 months

Observational gait analysis in children who walk is important, as is assessment of the preferential use of hand and neurological examination of the limbs. Neurological assessment should include tone and reflexes, muscle power as per UK Medical Research Council grading (Table 3) and, if possible, sensory function. True joint contractures should be differentiated from spasticity, and range of motion should be carefully documented. At the end of the examination, a concise documentation, summarizing the functional deficits and future goals, is helpful for communication with other professionals.

Table 2. Classification of cerebral palsy

Type	Clinical Signs
Neuropathic	
• Spastic	Hyper-reflexia, hypertonicity, clonus, Babinski sign
• Athetoid	Involuntary movements, dystonia, no joint contractures
• Ataxic	Lack of balance and coordination, wide-based gait
• Mixed	Spastic and athetoid signs, total body usually involved
• Hypotonic	Rare in the first 2–3 years, evolves into athetoid
Anatomical	
• Monoplegia	One limb involved, usually spastic
• Hemiplegia	Spastic ipsilateral limbs
• Paraplegia	Lower limbs only, familial type
• Diplegia	Lower limbs more involved than upper limbs, spastic
• Triplegia	Three limbs involved
• Total body involved/ quadriplegia	Four limbs involved with head, neck and trunk

Investigations

MRI, CT and PET may show intracranial disease; syndromic causes may require chromosomal analysis. Plain radiographs of the spine, hips and feet document deformities and plan corrections. Periodic radiographs of the pelvis are essential in spastic diplegics and non-ambulatory children because early treatment of a subluxating hip produces a better outcome. Gait analysis is valuable for dynamic assessment, management and outcome.

Management

A multidisciplinary approach involving paediatricians, physiotherapists, orthotists, orthopaedic surgeons, neurologists, rehabilitation physicians and neurosurgeons is important. The family should be the most important unit in this team, and the treatment should be tailored to the needs of each individual child.

Orthopaedic management is based on the natural history and prognosis of this condition. The surgeon can address only the problems of deformities and spasticity.

Early dynamic contractures. Treatment aims to prevent fixed contractures by stretching and casting, maintaining correction by fixed night splints, and dynamic orthoses to improve gait. Injection of botulinum-A toxin has been successful in decreasing the spasticity in young children in the UK. The effect of the injection lasts for about 3 months, but by then training the antagonist and agonist muscles usually helps the patient gain control of the joints and in ambulation. The toxin is injected into or near the site of nerve arborization, where it acts by blocking the presynaptic acetylcholine release at the myoneural junction. Intrathecal baclofen pumps, which act on spinal cord synaptic reflexes, may be useful in reducing dystonia and spasticity in patients who have difficulty in sitting or maintaining hygiene. Selective posterior rhizotomy has been used to reduce spasticity, but with unpredictable morbidity.

Staging when fixed contractures occur. Tendon releases or lengthenings are done at the musculotendinous junction to correct spasticity and prevent excessive weakness. Whole muscle transfers are not favoured because they cause opposite deformity due to the spasticity. Split transfers are preferred to prevent deformity around flexible joints.

Staging when bone deformities or joint problems occur requires a combination of soft tissue releases and bony surgery to prevent recurrence of the deformity. Gait analysis helps in decision making, and preferably soft tissue and bony surgery is done at a single sitting. Examination under anaesthesia differentiates between fixed and dynamic contractures.

Spastic hemiplegia. Children with spastic hemiplegia have a characteristic posture with a flexed elbow, pronated forearm, flexed wrist, internally rotated and flexed hip and knee, and equinus heel. The limb length discrepancy is usually <2.5 cm. These children are usually independent and educated in mainstream schools.

The mild form of spastic hemiplegia may have a drop foot gait that requires a leaf-spring orthosis. The severe form of this condition may require multilevel soft tissue surgery as well as external rotation osteotomy of the femur. Gastrocnemius slide is preferred over tendo-Achilles lengthening as often the soleus is not tight, and this also prevents excessive plantarflexion weakness. Varus deformity of the heel is due to overactivity of the tibialis posterior and can be corrected by intramuscular release or a split tendon transfer. Valgus deformity of the heel is corrected by either extra-articular subtalar arthrodesis or calcaneal lengthening if the subtalar and midfoot joints are mobile or by a heel shift osteotomy. The hemiplegic upper limb may require intramuscular lengthening or common flexor pronator slide, rerouting of the pronator tendon, or flexor-carpi ulnaris transfer to extensor carpi radialis brevis to improve function and cosmetic effect.

Spastic diplegia. Children with spastic diplegia slowly become independent walkers and have the typical crouch posture and spastic gait. They develop flexion-adduction contractures at the hip (scissoring gait), flexion contractures of the knee, equinus at the ankle and torsional deformities of the femur and tibia.

Table 3. UK Medical Research Council motor power scale

0	No contraction
1	A flicker of activity
2	Muscle contraction, but unable to overcome gravity
3	Muscle contraction able to overcome gravity, but not resistance
4	Contraction against resistance
5	Normal power

These children require multilevel soft tissue surgery at a single sitting. In general, the bony torsional deformities are corrected at one sitting, followed by soft tissue releases 6 weeks later. Three-dimensional gait analysis is most helpful to determine the dynamic range of the joints and power of the muscles, which helps surgical planning. Torsional deformities can be assessed using CT and precisely corrected. Femoral external rotation osteotomy is required for excessive anteversion, and occasionally tibial rotation osteotomy is needed, which is safely done at the supramalleolar level. The psoas is lengthened at the pelvic brim, and a cautious adductor release is done of adductor longus, gracilis and a part of adductor brevis. Distally around the knee, semitendinosus and gracilis are z-lengthened and flat tendons of semimembranosus and biceps are lengthened intramuscularly. Occasionally, because of a stiff knee gait and co-spasticity of the rectus femoris and the hamstrings, the rectus needs a distal release and, if necessary, a posterior transfer.

A gastrocnemius slide with or without soleal adjustment is often needed for equinus at the ankle. The foot deformities are corrected by subtalar fusion, calcaneal lengthening or, in the older child, by triple arthrodesis.

Spastic quadriplegia or total body involvement. More than 75% of children with spastic quadriplegia are unable to walk and many are dependent on carers. Ambulatory spastic quadriplegics need the same surgical treatment as diplegics. The goals in the globally involved child are to:

- Communicate with others,
- Carry out daily activities (eg, maintenance of personal hygiene) independently,
- Walk.

Priorities include a straight spine, level pelvis and mobile well-located hips for comfortable sitting in a wheelchair. The hips are at risk of subluxation or dislocation and may require regular radiographic assessment (Figure 1). Early soft tissue surgery prevents subluxation or dislocation, and maintenance with abduction splintage is important. Treatment is catered to the individual needs of the patient if presentation is late. Femoral and pelvic surgery is necessary to relocate the hip and reconstruct the acetabulum because 50% of patients with dislocated or subluxed hips are in pain. Complication rates are high and results are not uniformly good. Salvage options are proximal femoral resection, proximal femoral valgus osteotomy, arthrodesis and total hip replacement in selected patients. Spinal surgery for scoliosis is indicated if scoliosis develops rapidly and if sitting is extremely difficult.

Figure 1. Radiograph showing pelvic obliquity, subluxation of the left hip and acetabular dysplasia

Figure 2. Myelomeningocele

SPINA BIFIDA

Spina bifida is a paralytic condition caused by abnormal or incomplete closure of the neural tube and the posterior vertebral arches during embryonic development. The spinal cord and the meninges are involved. This usually results in bowel, bladder, motor and sensory paralysis distal to the malformation. Spinal dysraphism refers to hidden abnormalities that affect the spinal cord or cauda equina and which usually present later with subtle neurological disturbances.

Aetiology and Pathogenesis

Neural tube defects have a multifactorial pattern of inheritance. Folate deficiency is implicated, as are other vitamin deficiencies, maternal diabetes mellitus and other factors. The incidence has decreased owing to prenatal diagnosis and early abortion, folate administration to women who are likely to get pregnant and emigration from high-risk areas. The highest incidence is 5 per 1,000 live births in Ireland, Wales and the north of England. The incidence is less than 1 per 1,000 live births in Australia and North America.

Spina bifida may be subdivided into spina bifida cystica and spina bifida occulta.

Spina bifida cystica is a severe form in which there is a visible cyst. Several different abnormalities may be seen:

- Myelocele is the most severe form in which the neural plate material is evident.
- Myelomeningocele is the most common form and is a cystic with dura and arachnoid protruding through the defect. (Figure 2)
- Meningocele is a cystic swelling with dura and arachnoid under the skin.

Spina bifida occulta is associated with external spinal defect markers such as a dimple, a tuft of hair, a naevus or a lipoma.

Other systems are often involved. Arnold-Chiari malformations leading to hydrocephalus are noted, and 70% of these require ventriculoperitoneal shunts. There may be cerebellar hypoplasia, syringomyelia and diastematiomyelia; 50–65% of affected children have normal intelligence.

Management

Aims of treatment and initial assessment. The main goal of management is a stable posture. Ambulation is not the goal for every child. In spite of the best medical and surgical care, 40% of children with spina bifida will not walk as adults. Quite often, the activities of daily living can be achieved without lower-extremity function. The lifetime prognosis should be considered before aggressive orthopaedic treatment is instituted. Almost all patients with L2, L3 or higher-level lesions are wheelchair users, and more than two-thirds of those with lower-level lesions (L3 to L5) use a wheelchair at least part of the time.

Most children achieve their maximal level of ambulation around the age of 4 years. Walking is unlikely if a child with spina bifida is not standing independently by the age of about 6 years. Prerequisites for walking include a spine balanced over the pelvis, absence of hip and knee contractures, and plantigrade, supple, braceable feet.

Orthopaedic evaluation of a child with spina bifida is shown in Table 4.

Treatment is aimed at obtaining effective mobility with minimal restriction. Bracing and splinting vary with the degree of motor deficit and trunk balance, and each child should be carefully evaluated by the orthopaedic surgeon, physiotherapist and orthotist. Children aged 12–18 months may benefit from an A-frame for standing. A parapodium supports the spine and helps ambulation for children aged >2 years. A rigid ankle-foot orthosis is used in children with low lumbar or sacral-level lesions and fair quadriceps muscle function. A knee-ankle-foot orthosis may be indicated for a child with weak quadriceps to prevent knee valgus. Children with high-level lesions have excessive anterior pelvic tilt and exaggerated lumbar lordosis and require a hip-knee-ankle-foot orthosis with a pelvic band or a reciprocating gait orthosis.

Foot deformities like clubfeet and congenital vertical talus need stretching and serial casting immediately after birth. Subsequently, they need radical soft tissue releases. The correction is maintained with a splint or orthosis. However, due to high recurrence rate, a significant number of children need a bony procedure. Talectomy is reserved for severe deformities.

Management of hip subluxation or dislocation is difficult. The dislocations can be ignored for high lesions. Attempts should be made with soft tissue surgery, pelvic and femoral osteotomy to contain the hip for patients with good quadriceps function who are ambulant.

Most surgical procedures are done during the first 15 years of life. The deformity should be completely and permanently corrected if surgery is indicated. Treatment plans for the affected areas are described in Table 5.

Table 4. Orthopaedic evaluation of spina bifida

- Serial sensory and motor evaluations to evaluate neurological level of function
- Sitting balance as an indication of central nervous system function
- Upper extremity and hand function, including grip strength and pinch
- Spinal curvature on annual clinical and radiographic examination
- Range of motion, stability and contractures of the hip
- Alignment, range of motion, contracture and spasticity of the knee
- Rotational deformities, including external tibial torsion
- Ankle valgus deformity
- Other foot deformities, including clubfoot and congenital vertical talus

POLIOMYELITIS

Poliomyelitis is a viral infection that affects the anterior horn cells of the spinal cord, producing lower motor neuron paralysis or paresis. Prophylactic immunization programmes have eradicated this condition from the developed world, but the orthopaedic surgeon may see a residual paralytic adult

Table 5. Treatment options for spina bifida

Region	Treatment Options
Spine	
Scoliosis	• Congenital scoliosis by limited posterior fusion and occasionally by hemi-epiphyseodeses
	• Neuromuscular scoliosis by bracing and later anterior and posterior fusion
Kyphosis	• Kyphectomy for severe cases
Hip	• Radical soft tissue releases for contractures
	• Surgery for unilateral subluxated or dislocated hip
	• If required, varus femoral osteotomy, acetabular surgery and iliopsoas and other muscle transfers when necessary
Knee	• Physiotherapy mainly, posterior releases if needed
Foot	• Calcaneus deformity by posterior transfer of tibialis anterior, triple arthrodesis
	• Valgus at the ankle by osteotomy or medial physeal stapling
	• Valgus at the subtalar joint by extra-articular arthrodesis, subtalar or triple arthrodesis

or a child from an immigrant population. About 10 million people worldwide have residual paralysis after poliomyelitis.

Diagnosis

Poliomyelitis is usually diagnosed by clinical examination because it affects purely motor activities. It should be differentiated from the symmetrical paralysis of Guillain-Barré syndrome. Muscles with the least number of columns of anterior horn cells are most affected, particularly the tibialis anterior muscle, which results in a foot drop. The tensor fascia lata has the greatest number of columns of anterior horn cells, and commonly the deforming force through the iliotibial band, not only at the hip, but also at the knee and pelvis, produces secondary deformity at the spine and leg length inequality. In the upper limb, the deltoid and the interossei muscles are similarly affected owing to their discrete level in the cord.

Management

Treatment of poliomyelitis aims to improve function by improving gait and preventing deformity and to decrease bracing through surgery. The principles of surgery are based on correcting contractures and then stabilizing the joint, where possible, by appropriate tendon transfers. Bony surgery may also be necessary in the older child. Progressive scoliosis requires instrumentations and fusion when bracing fails.

Proximal surgical release of flexors and abductors at the hip, and distal release of iliotibial band and knee flexors may be required. Serial castings are often followed by soft tissue procedures at the knee and, in severe contractures, require supracondylar femoral extension osteotomy. Equinus at the ankle is treated by open heel-cord lengthening and then bracing, depending on the weakness at each level. Never lengthen heel cord in a child with quadriceps weakness because the child compensates for the weakness by hyperextension at the knee using the equinus contracture. Early tendon transfers and later foot stabilization are necessary.

Limb lengthening can be considered at skeletal maturity. Surgery to correct contractures, balancing the muscles around the joints and the use of osteotomies and arthrodeses, especially around the foot, obviate the need for cumbersome orthoses.

Upper extremity problems can also be dealt with by surgery. Flail shoulder is common and, if the serratus anterior muscle is functioning, the glenohumeral joint can be fused. Flexion at the elbow can be restored by transferring the origins of the wrist flexors or extensors more proximally on the humerus.

About the Authors

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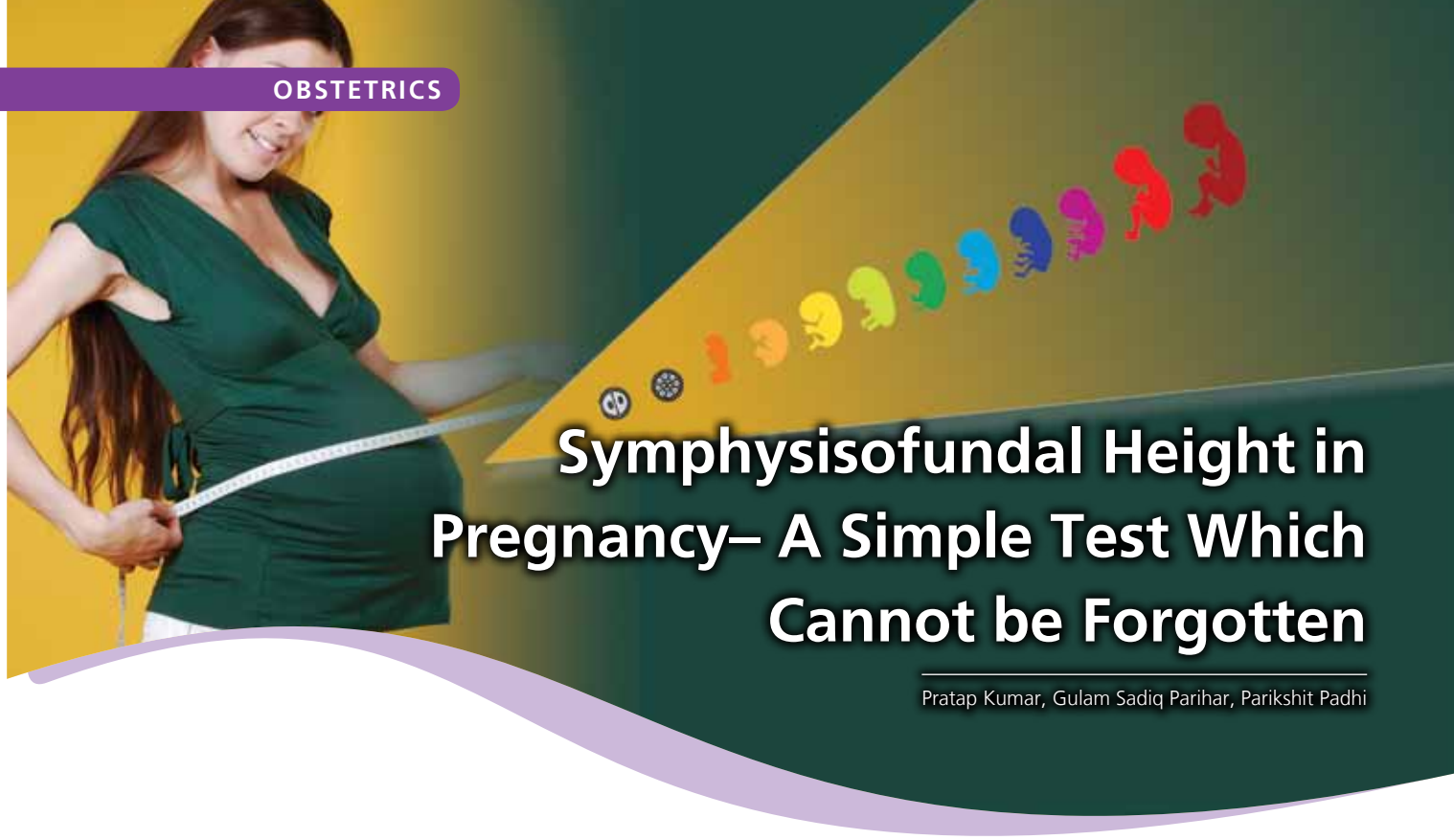
Case of the Month

An Interesting Case of Successful Pregnancy

KC Pandey, Abhishek Singh, Godavari Joshi, SC Joshi, NK Pant

A twenty seven years old nulliparous female, married for five years underwent surgery for right sided tubo-ovarian mass at a private medical setup. She was referred to our tertiary care centre when the histopathological analysis of the operated specimen was found to be in favor of well differentiated endometroid adenocarcinoma of right ovary. On examination, the patient was anemic and had labored respiration with increased respiratory rate. The vocal fremitus, vocal resonance and respiratory sounds were decreased in right infra-scapular and inter-scapular region. Her operative wound had healed well. The abdomen was distended with fullness in flanks. Shifting dullness was present. There was a palpable mass in left iliac fossa and hypogastrium. Computed tomography (CT) scan of thorax, abdomen and pelvis revealed large multi-septate complex solid cyst in pelvis with ascites with metastatic pleural and pulmonary involvement with right pleural effusion. Her hemoglobin levels were 6 gm/dl while rest of the haemogram, liver function tests and renal function tests were within normal limits. The serum cancer antigen 125 (CA-125) levels were 285 micrograms/ml. Immediate blood transfusion was done followed by ascitic and pleural tap to relieve patient of her symptoms. She was then administered six cycles of paclitaxel and carboplatin based chemotherapy at a gap of three weeks. She tolerated chemotherapy well and was asymptomatic after six cycles of chemotherapy. Her CA-125 levels were within normal limits. Post chemotherapy CT scan showed resolution of pleural effusion, ascites and omental nodularities but there was a residual mass in left ovary. Patient was advised surgery for the same but she refused as she had no children and was then lost in follow-up. Three months after her chemotherapy, she reported with history of amenorrhea for past three months with spotting per vaginum for past ten days. Ultrasonography examination of whole abdomen showed that she had pregnancy of twelve weeks with large lobulated cystic lesion in left adenexa with thick internal septae. Patient was counseled regarding options of termination of pregnancy, chemotherapy and its successful use during pregnancy but she decided to continue with pregnancy without any chemotherapy as this was her first pregnancy. She was on regular follow-up throughout pregnancy. Folic acid, iron and calcium supplementation were given regularly. In the second trimester, she developed moderate pregnancy induced hypertension which was managed with the help of anti-hypertensives. Apart from raised levels of CA-125 and mild proteinuria, all her investigations were normal. Patient was advised elective caesarian section at 37 weeks of pregnancy but patient didn't turn up. She came to emergency department at full term with labor pains. On general examination, her general condition was average, mild pallor was present, pulse rate was 96/min and blood pressure was 140/90mm Hg. Per abdominal examination revealed distended abdomen with fundal height of 36 weeks and large irregular firm mass in left hypochondrium and epigastrium. Foetal presentation was cephalic and heart rate was 144/min. Mild uterine contractions were present. On per vaginal examination, os was two fingers loose, cervix was fully effaced and pelvis borderline. Patient was immediately taken for emergency caesarian section. Lower segment caesarian section was done under epidural anesthesia. A healthy male baby, weighing two and a half kilograms with apgar score 8/10 was delivered. There were massive adhesion between uterus and the anterior abdominal wall with increased vascularity. Multiple engorged venous plexuses were present in the parietal peritoneum. The ovarian mass was adhered to the surrounding structures. Debulking of the tumour was done. Patient was again administered chemotherapy for six cycles. After two years of follow-up, the baby shows normal growth and there is no evidence of recurrent or residual disease in the patient.

(Continued on page 364)



Symphysisofundal Height in Pregnancy– A Simple Test Which Cannot be Forgotten

Pratap Kumar, Gulam Sadiq Parihar, Parikshit Padhi

INTRODUCTION

Serial fundal height measurements (SFH) are a simple, safe, inexpensive and reasonably accurate screening method to detect small for gestational foetuses'.[1] It is a routine procedure done at every antenatal visit. By definition it is the height of the fundus of the uterus, measured in centimetres from the top of the symphysis pubis to the highest point in the midline at the top of the uterus. SFH can be used as a method to detect foetal growth and complications like intrauterine growth restriction (IUGR). This screening test can be done in any clinic and when in ultrasound can be used for further diagnosis.

Techniques

Common method[2] most widely used today to measure symphysisofundal height. This method includes:

- A tape calibrated in centimetres applied over the abdomen curvature from upper edge of symphysis to the upper edge of the uterus fundus (identified by palpation 1st resistance felt per abdomen).
- Bladder emptied before measurement. Tape applied with markings away from the examiner to avoid bias.
- If the fundal height is more than 2–3 cm from the expected then inappropriate foetal growth may be suspected.

Fundal height measurement techniques can be categorised into three types of measurement procedures: measurements obtained by comparing the height of the uterine fundus to landmarks on the maternal abdomen; measurements obtained by using a tape measure; and measurements obtained by using a pelvimety calliper.[3]

Review of Literature

Various studies has shown that there are many discrepancies that can occur while measuring the symphysisofundal height which can alter one's reading and thus its interpretation. This could lead to over diagnosing or under diagnosing many conditions such as IUGR, diabetes mellitus, etc. One such fallacy that can occur is due to the variation in the abdominal length of the pregnant woman. The fundal height when measured in weeks the umbilicus is used as a reference point. However studies have showed that there are variations in the position of the umbilicus as well as there are variations in the abdominal length. Thus by palpating abdomens of different length, the uteri of same heights may be interpreted differently.[4] Thus anatomical discrepancies may lead to a false interpretation of fundal height. Hence healthcare providers will tend to believe that the pregnancy could have a risk involved, thus leading the mother to undergo many tests which she may actually not need. Also the pregnant woman may have to undergo the mental trauma of having to believe that there is a problem with her baby.

Another fallacy that is very common is the inter-personal measurements which can vary. Many doctors around the world use different techniques and tools to measure the fundal height. Hence when taking the previous fundal height reading into account a doctor may believe that there could be a sudden increase, decrease or no change in the fundal height making them suspect an underlying problem with the pregnancy. It is for this reason that women are advised to visit one doctor instead of visiting different doctors throughout their pregnancy because the doctor will be familiar with the pregnant woman and will be better able to judge whether there is an actual risk in the pregnancy.[6]

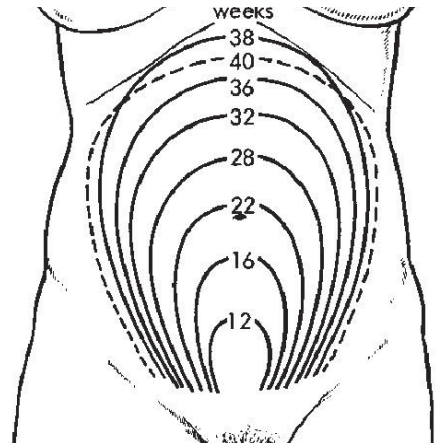
Studies have also shown that the position of the mother can alter the fundal height measurement. If the mother is in supine position, then the measurements were the largest. If she was in a trunk elevation or knee flexion position, then the measurement was the smallest.[5]

There are other fallacies associated in the fundal height measurement. Sometimes a woman may have a full bladder which can cause the uterine height to be more than what it really. If the foetal head has engaged into the pelvis is can give a lesser measurement. Many a times the woman may give the doctor the wrong dates leading to an error in the findings. The position of the fetus too can alter the reading especially if the baby is in a transverse or diagonal position.

To overcome these fallacies an ultrasound assessment of the gestational age can be used to get an accurate estimate of the gestational age. Ultrasound parameters such as crown-rump length, abdominal circumference, bi-parietal diameter, head circumference and femur length gives the most accurate gestational age. Due to fallacies in finding gestational age by last menstrual period (LMP) or SFH many high risk cases go undiagnosed. Studies showed that by taking LMP as the gestational age and by taking an early ultrasound report to find gestational age more preterm cases have been reported in women who had undergone an early ultrasound assessment.[8] This occurred due to a leftward shift in the ultrasound-based gestational age compared to the LMP based gestational age. Any suspected case where one may get an abnormal value for a SFH measurement should always go

for an ultrasound for confirmation and for possible detection as to what the problem may be since an ultrasound is one of the best diagnostic tools in obstetrics.

Although the measurement of symphysisofundal height does have its fallacies and discrepancies it is still as an essential tool in the field of obstetrics especially in the developing part of the world such as South-East Asia and Africa due to it being a convenient, cheap and effective tool to diagnose obstetric complications. A study in India population showed that SFH measurement can be a good indicator for low birth weight. The study shows that there is a positive co-relation of 0.74 between fundal height and birth weight.[11] In the rural and peripheral areas of the developing countries there is a limitation in the availability of facilities like ultrasound. In such a scenario symphysisfundal height can be a simple and effective tool. It has a lot of relevance in large clinics as patient may be examined by many doctors over her pregnancy as compared to smaller private practices. By training nurses and mid-wives in measuring symphysisfundal height and when to refer, a significant number of high risk pregnancies can be detected. Another study comparing symphysisfundal height (especially in obese women) and predicting macrosomia was conducted. Since ultrasound and SFH can have its limitations in morbidly obese women the study revealed that, compared to ultrasound SFH and maternal weight are better predictors of neonatal macrosomia compared to ultrasound.[12] SFH also can be used to predict the chance of arrest during labour. It is shown that maternal-foetal ratio (maternal height in centimetres/SFH) is a good predictor of labour arrest compared to predicting it by using Ultrasound guided estimation of foetal weight.[13] Thus obstericians need to emphasise the importance of SFH, since ultrasound in various demographic areas may not be available and access to an ultrasound is comparatively low and this simple test can be an immense boost in lowering mortality and morbidity rates.



The interpretation of fundal height measurements

Gravidogram (plotting of the SFH in a graphic manner) is a diagnostic tool for high risk group patients such as gestational diabetes melliteus, twins, macrosomia etc. The gravidogram graphically depicts the uterine growth and the maternal bodyweight changes. These changes can be compared to standard values. Studies in Sweden have shown that frequent use of gravidogram has shown to reduce foetal mortality by about 50%.[7] It's ideal to get the values in between the 10th and 90th percentile. These values vary from places and population and ideally a standard should be made according to the demography of the area because studies show that demographic variations do exist.[10] Comparing to this standard if a value falls below the 10th percentile one should suspect small for gestational age and if a value comes more than the 19th percentile then causes of macrosomia, hydramnios should be suspected and further follow up tests will be needed. This simple graph is an inexpensive and easy method to ensure that any woman who may recently have developed a complication can be

picked up at an earlier stage. An early diagnosis will ensure better care for the mother and the fetus and can reduce the maternal and perinatal mortality rates. Another study was done to prospectively test the value of a symphysisfundal measurement in labour of less than or equal to 29 cm as a predictor of birth mass below 2000 g.[14]

A total of 1216 women were included in the study. One hundred 21 foetuses had a birth mass <2000 g (10%). A measurement of ≤29 cm had a sensitivity of 69% and a specificity of 98% with a positive predictive value of 81% and a negative predictive value of 97%. On the receiver-operator curve a cutoff of 30 cm showed a better sensitivity with little loss of specificity. The study concluded that a symphysis-fundal measurement of ≤29 cm is a good predictor of birth mass <2000 g and can be used as an indication for referral to centres with neonatal facilities. To compare the accuracy of the reported date of the LMP with that of SFH in the estimation of gestational age (GA), using an ultrasound scan as reference a study on GA was concurrently assessed by the 3 methods in this prospective, population-based, pregnancy-outcome study with 1128 women between 20 and 26 weeks of a singleton pregnancy.[15] The mean GA was less by ultrasound than by SFH measurement or the reported LMP, and the mean differences with the US result were statistically significant (p<0.001 for both). At delivery, about 75% of the GA values estimated by SFH measurement were within 7 days and almost 91% were within 14 days of the estimation by ultrasound, compared with 65% and 82% for the GA estimated by the reported LMP. Moreover, using the ultrasound as reference, the SFH correctly classified 84% of the term, 68% of the preterm, and 86% of the post-term deliveries (weighted kappa=0.58) compared with the corresponding 79%, 61%, and 55% predicted by the reported LMP (weighted kappa=0.44).The study concluded that the SFH measurement was found to be more accurate than the reported LMP as a tool to estimate GA and therefore date of delivery, but neither were as accurate as a ultrasound scan. In another prospective study, SFH was measured in centimeters at different weeks of gestation from 20th week onwards in 100 healthy women with uncomplicated pregnancies. A curve was plotted based on the mean SFH measurements with standard deviation. Readings were also arranged on the basis of 10th, 50th and 90th percentiles. Percentile curve was similar to the curve based on mean with standard deviation. The rate of growth was 1 cm/week between 20–32 weeks. Thereafter, there was a slight fall in the rate of growth. SFH measurement is a simple method of foetal growth assessment which can be utilised even by paramedical workers to screen for small for gestational age babies. The study suggested that it is better to have a standard curve derived from the population as there is regional variation.[16]

CONCLUSION

SFH should be a routine examination done during every antenatal visit, which assists in picking up high-risk pregnancies. Many conditions like IUGR, macrosomia and hydramnios can easily be suspected by this simple manoeuvre. However many discrepancies occur due to error in measurement or due to variations which occur in the mothers' physique. Errors which can be controlled should be limited so not to overdiagnose or underdiagnose a condition. To overcome these fallacies which can occur an ultrasound assessment of the gestational age gives us the best estimate of the foetal weight as well as it can help us come to a diagnosis. However the fundal height measurement has proved to be a very effective and inexpensive tool in early diagnosis of complications of foetal growth. To depict

the variations in SFH it can be plotted on a graph called a gravidogram which should be compared to a standard of that population. It gives us a visual representation of the SFH and gives us a higher specificity if compared to population of that area rather than general population.

This simple tool will always remain in the field of obstetrics and gynaecology due to the immense benefits that can be availed.

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Triple-Negative Breast Cancer: Management Options for a Distinct Subtype

Anusuya Gehlot, Nita Trehan, Akkhil Chatwal, Surbhi Raichandani

It was estimated that despite of 2,07,090 women being diagnosed with breast cancer in the US in 2010, the mortality associated with breast cancer has reduced.[1] This decline has principally been attributed to both a multidisciplinary approach to the management of breast cancer and a deeper understanding of its biology leading to individualised treatment. The use of hormone receptor and the hormone receptors-related genes, the human epidermal growth factor receptor 2 (HER2) status has been used to stratify breast tumours into subtypes akin to those identified by gene expression profiling techniques.[2,3] Recently, studies have identified the triple receptor-negative breast cancer (TNBC) subtype characterised by the lack of expression of both hormone receptors as well as lack of over expression and/or lack of gene amplification of HER2, to be associated with the worst prognostic outcome.[4]

DEFINING TRIPEL-NEGATIVE BREAST CANCER

TNBC refers to the breast cancer phenotype where the oestrogen and progesterone receptors are negative as assessed by immunohistochemistry (IHC), and there is a lack of over expression of HER2, as assessed by IHC, or the absence of its gene amplification as assessed by fluorescence in-situ hybridisation techniques.[5] In contrast, 'basal-like' tumours refer to a molecular phenotype, that has been characterised by an intrinsic gene set identified by messenger RNA (mRNA) gene expression profiling. Although a

lot of overlap exists between TNBC and the 'basal-like' subtype, there is also evidence of discordance between the two (30%).

Risk Factors

- Age at diagnosis <50 years.
- African American ethnicity
- High body mass index
- Young age at menarche
- High parity
- Young age at time of first birth
- Lack of breast feeding

RADIOLOGICAL FEATURES

Radiological features include the presence of smooth circumscribed mass, generally a lack of calcification and/or speculated margin on a mammogram, and a lack of an echogenic halo on ultrasound.[6] MRI findings were associated with the presence of a mass lesion with smooth margins, rim enhancement, persistent enhancement pattern and very high intratumoural signal intensity on T_2-weighted MRI.[7] Using flurodeoxy glucose (FDG) positron emission homography (FDG-PET), they have demonstrated higher FDG uptake than other breast tumour subtype, a feature in keeping with their aggressive biology.[8]

MANAGEMENT OPTIONS

The multidisciplinary management of women with breast cancer has had a positive impact on survival outcomes, indicating the importance of the various components of treatment including surgery, chemotherapy and radiation therapy where indicated.

A number of studies have made the interesting observations that when women with TNBCs are subjected to preoperative chemotherapy a greater response to treatment is observed than a women with other subtype of breast cancer.[9] This is an especially important observation because evidence indicates that attaining a pathological complete response (pCR) to preoperative chemotherapy serves not only as an *in-vivo* assessment of *in-vivo* chemosensitivity but also as a surrogate marker of long-term outcome.[10] The addition of ixabepilone, a microtubule stabilising agent, in the preoperative setting resulted in 26% pCR among women with TNBC[11] and then followed by docetaxel.

With the known close association between TNBC and BRCA1 mutations several studies have investigated an increased sensitivity to platinum agents such as carboplatin and cisplatin.[12] Several other targeted agents have been investigated among women with TNBCs, including agents targeted against EGFR that is cetuximab,[13] anti-angiogenic agents, multityrosine kinase inhibitors that is sunitinib malaete[14] and poly (ADP-ribose) polymerase (PARP) inhibitors like iniparib, etc.

Prognosis and Patterns of Recurrences

Women with TNBC had an increased risk of deaths and distant recurrences compared with women with non-TNBC.[15] Several unique features regarding the recurrence patterns in women have been identified. First, the peak risk of recurrence occurs during the first 3 years following treatment. Second, short survival time is typically observed following a diagnosis of metastatic TNBC. Third, the visceral (brain) and soft tissue relapses are more common than bone relapse among women with TNBC.[16]

CONCLUSIONS

TNBC represents a distinct subtype of breast cancers that is associated with unique clinical characteristics, risk factors, prognostic outcomes and sensitivity to chemotherapeutic agents. Although women with 'basal-like' tumours (defined as

hormone receptor negative, HER-2 negative, CK5/6 positive and/or HER-1 positive) could be better characterised by immunohistochemistry, than these tumours. Approximately 10–15% of breast carcinomas are known to be the TNBC subtype, which constitutes 80% of all 'basal-like' tumours. TNBC has a worse prognosis and tends to relapse early compared with other subtype of breast cancer. Several agents are currently under investigation for the treatment of TNBC, including anti-angiogenic agents, PARP inhibitors, as well as DNA-damaging agents such as platinums. It is hoped that results from studies investigating these agents will have a positive impact on this prognostically poor subtype of breast cancer.

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Case of the Month

An Interesting Case of Successful Pregnancy

KC Pandey, Abhishek Singh, Godavari Joshi, SC Joshi, NK Pant

ANSWER

SUCCESSFUL PREGNANCY IN CARCINOMA BILATERAL OVARIES

There are cases reported in literature where patients were treated for ovarian malignancies during pregnancy by chemotherapy with successful outcomes.[1,2,3] The chemotherapy used was usually a combination of paclitaxel and carboplatin. Tabata et al., and associates used carboplatin as single agent during pregnancy for treatment till elective caesarian section. Though combination of paclitaxel and carboplatin is not the first line treatment of dysgerminoma ovary, M Hubalek et al., used it successfully to treat the same in a pregnant patient.[4] The same combination has been used to treat non small cell lung carcinoma in a pregnant patient.[5] In our patient too, the same combination was used but, unlike the use during pregnancy as in other cases, here chemotherapy was administered before pregnancy. Before the start of chemotherapy in this patient, her right ovary was already excised and left ovary was grossly involved by the disease. Chemotherapy is known to have diminishing effect on fertility. Successful pregnancy after surgical removal of one ovary, gross involvement of the contralateral ovary by disease and use of chemotherapy makes this case an interesting as well as encouraging one. Besides this case, S Jha et al., described a case of recurrent angiosarcoma of ovary treated with a combination of adriamycin and ifosphamide followed by pregnancy.[6] Our case is distinctive for successful pregnancy after treatment for bilateral disease.

Conclusion

Though known for its diminishing effect on fertility, successful pregnancy is possible after chemotherapy. Besides the rarity of the case, the encouraging outcome compels us to report this case.

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Optimised Labour Protocol in the Modern Management of Labour

Poojan Dogra Marwaha, KB Gupta, Harkiran Bala, Renu Sharma, Neerja

INTRODUCTION

Labour and childbirth are natural events. Childbirth should be an event of joy and satisfaction rather than stress and distress. Intrapartum care has undergone an evolution based on scientific evidence. optimised labour (programmed labour) is a modern way of managing the labour with a definite plan of induction, augmentation and stimulation of labour along with labour analgesia to achieve day time delivery. It is shorter labour, comfortable, simple and inexpensive. It incorporates an appropriate combination of analgesics and antispasmodics which are synergistic in active phase of labour.

The study was undertaken to assess the safety and efficacy of optimising labour protocols and its effect on the mother and neonates.

METHOD

The present study was conducted for a period of 1 year. The study included a total of 200 fullterm (37–40 weeks) women with low risk singleton pregnancy with vertex presentation in active phase of labour. These included 103 primigravidae and 57 multigravidae with parity >3. None had clinical evidence of cephalopelvic disproportion, history of previous caesarian section, past history of cervical amputation or trachelorhaphy or a history of any medical disorder.

The women were randomly assigned into 2 groups: study group and control group. The study group consisted of 100 women who received optimised labour protocol while the control group of 100 pregnant women was managed expectantly. To all women, general physical examination, systemic examination and obstetrical examination including vaginal examination were performed. Informed consent for inclusion in the study was obtained.

To the study group, when the patient entered the active phase of labour, amniotomy was done to confirm clear liquor and satisfactory foetal heart rate pattern. Intravenous infusion was started with ringer lactate/5%dextrose. If uterine contractions were not satisfactory, oxytocin was given by escalation technique till 3 sustained uterine contractions in 10 minutes, each lasting for 35–45 seconds were achieved. A low dose of sedative and analgesic consisting of 2 mg of diazepam and 6 mg of pentazocine, diluted with 10 cc of normal saline was administered slowly as bolus form through the tubing of infusion line to initiate pain relief and sleep. Injection of tramadol (1 mg/kg body weight) with injection of drotavarine 40 mg was administered slowly intravenously.

Progress of labour was monitored on the partogram. If required intravenous drotavarine was repeated after 2 hours. When the cervix was 7–8 cm dilated women started to have bearing down sensation, the patient was administered injection ketamine, if required, in the initial doses of 0.5 mg/kg of body weight diluted in 10 ml of normal saline slowly over 10 minutes through an infusion line. If woman continued to complain of pain, a top up dose of half the initial dose i.e., 0.25 mg/kg body weight was repeated as

Table 1. Distribution of cases according to pain relief score

Pain relief score	GROUP-1 (Study group) n=100					
	Primegravidae (n=53)		Overweight group		Total (n=100)	
	Number	Percentage	Number	Percentage	Number	Percentage
0	00	0.00	00	00	00	0.00
1	05	71.00	02	29.00	07	07.00
2	13	46.00	15	54.00	28	28.00
3	35	54.00	30	46.00	65	65.00

P=0.813; Pain relief was assessed according to "pain relief score "as follows; Score 0 = No relief of pain; Score 1 = Pain relief present, but not to the desired extent; Score 2 = Substantial relief of pain; Score 3= Complete relief of pain

maintenance dose every 3 minutes till delivery. A final dose of 0.25 mg /kg body weight was given immediately after delivery of the baby.

Active management of third stage of labour was done by administering 125 microgram PG 2 at deep IM after birth of the baby. After delivery, remaining 4/5th of diazepam and pentazocine were added to fresh infusion vac and given intravenously over 2 hours.

In the control group, amniotomy was done when patient entered active stage of labour and injection oxytocin was started in escalating doses if uterine contractions were not satisfactory. In both the groups, labour was monitored partographically with routine intermittent auscultation every 15 minutes in the first stage of labour and every 5 minutes during the second stage of labour. The time of onset of analgesia was recorded. The degree of analgesia was recorded on scale of 0–3. (0–no pain relief, 1–mild pain relief, 3–good pain relief). Any side-effect of drugs was noted. Duration of 3 stages of labour, amount of blood loss and mode of delivery were noted. Apgar score of every newborn was noted 1 and 5 minutes as well as perinatal outcome.

RESULTS

Both groups were comparable in age, parity and period of gestation at the time of onset of labour pains. The mean age of women in study group was 25.46 years while in the control group was 24.82 years. There were 53% primigravidae in study group and 5.9% of the control group. The percentage of gravida 2 and 3 was 27% and 20% in the study group and 30% and 20% in the control group. Mean gestational age was 39.28 weeks in the study group and 38.95 weeks in the control group.

The mean time of onset of analgesia was 8.78±1.84 minutes. Sixty five percentage of women achieved complete pain relief, 28% had substantial pain relief, and 7% had pain relief but not to the desired extent (score 1) (Table-1). Thirty four percent of women required ketamine for pain relief.

The mean duration of active phase of labour was 2.79±1.05 hours in study group and 5.07±1.13 hours in the control group (Table 2). The difference between the two groups was highly significant (p value =0.000). The mean duration of active phase in primigravidae was 3.58±0.95 hours in the study group and 5.85 ±0.90 hours in control group. The mean duration of active phase of labour in multigravidae was 20.2±0.41 hours in the study group and 4.36±0.76 hours in the control group.

The mean duration of second stage of labour was 24.62±5.69 minutes in

Table 2. Distribution of stages of labour

Mean Duration	Study Group	Control Group	P Value
Active phase (hrs)	2.96+/-1.07hrs	5.09+/-1.13	0.000
Second stage (min)	24.62+/-5.69 min	34.61+/-6.87	0.000
Third stage (min)	3.13+/-0.49 min	10.96+/-17.19	0.000

Table 3. Distribution of cases according to meternal side effects and complications

Maternal morbidity and side effects	Group- 1 (Study group) n=100		Group-2 (Control group) n=100		P value
	Number	Percentage	Number	Percentage	
Tachycardia	68	68.00	16	16.00	0.000(S)
Nausea	56	56.00	10	10.00	0.000(S)
Vomiting	41	41.00	10	10.00	0.000(S)
Diarrrhoea	12	12.00	02	02.00	0.006(S)
Drowsiness	12	12.00	00	00.00	0.000(S)
Cervical tear	01	01.00	04	04.00	0.083(S)
Vaginal tear/laceration	00	0.00	03	03.00	0.083(S)
Amnesia	10	10.00	00	00.00	0.000(S)
Hallucinations	05	05.00	00	00.00	0.000(S)

study group and 34.61±6.87 minutes in the control group. The mean duration of second stage in primigravidae was 28.54±4.20 minutes in the study group and 35.69±7.73 minutes in the control group, while in the multigravidae it was 20.19±3.45 minutes and 33.52±5.76 minutes. All these differences were highly significant (p=0.000).

The mean duration of third stage was 3.13±49 minutes and 10.96±17.19 minutes in the study and control group (Table 2). In primigravidae it was 3.17±56 minutes and 9.90±2.05 minutes in study and control group. While in multigravidae it was 3.09±41 minutes and 12.02±24.30 minutes in study and control group. All these differences were highly significant (p=0.000).

The average blood loss was 105.80±66.91 ml in study group and 216.95±142.51 ml in control group. The mean blood loss in primigravidae in study group was 114.53±90.80 ml and in control group 223.90±152.35 ml. In multigravidae it was 95.96±11.40 ml in the study group and 210.00±133.13 ml in the control group. All these differences were highly significant (p=0.000).

Minor side-effects were observed (tachycardia, nausea, vomiting, diarrhoea, drowsiness and hallucinations) and were more frequent in study than control group and had no effect on maternal morbidity. No women in either group had postpartum haemorrhage and post partum psychosis. (Table 3) The mean Apgar score at one minute was 7 in the study group and 6.99 in the control group while at 5 minutes it was 9 in the study group and 8.99 in the control group. There were no neonatal complications in immediate postpartum period in study as well as the control group.

DISCUSSION

In the present study, majority of women (93%; 90.5% primigravidae, 95.74% multiparae) had substantial to complete relief of pain in labour. Mean time to onset of analgesia in the study group was 8.78 minutes. Husstein et al., (1987)[1] observed analgesic effect after 10 minutes while Jyoti et al.,[2] observed it after 17 minutes. The early onset of analgesia in present study could be because tramadol was given intravenously, while in above studies it was given intramuscularly.

With ketamine, mean time of analgesia was 59.47 seconds. Dutta and Rehman (1994)[3] observed mean time of analgesia of 4 minutes after ketamine in most cases. The difference observed may be because they gave continuous infusion of low dose of ketamine (0.5mg/kg body weight) in 540 cc of 5% dextrose at the rate of 90–100 drops/minute till four minutes or till the effect of ketamine manifests.

Mean active phase of labour was significantly shorter in study group compared to control group (2.49 hours *vs.* 5.9 hours) (primigravidae-3.58 hours *vs.* 5.85 hours, Multigravidae 2.09 hours

vs. 4.36 hours). Similar reduction in mean active phase of labour was observed by Daftary[4] et al., in primigravidas (3.5 hours *vs.* 5.2 hours). The reduction in blood loss can be of importance in developing countries like India where most of women are already anaemic.

All the neonates had Apgar scores of more than 7 at both 1 and 5 minutes showing that the drugs used in optimised labour protocol had no adverse effect on newborn and can be used safely. Similar observation was made by other authors.[5,6] Minor side-effects and complications were observed in present study which were comparable with side-effects reported by Daftary et al.,[4] and did not raise anxiety in patient. No serious side effects were seen in 30% of women who required ketamine since the protocol used only low doses of ketamine. Ketamine is known to readily cross placental barrier and cause respiratory depression in neonates in doses exceeding 1 mg/kg body weight. So it should be given after obstetrician learns and gets familiar with its use.

CONCLUSION

Optimised labour is a new but fast growing method of delivery. It is simple, safe, effective and inexpensive method without any adverse-effect. The protocol has kept broad safety margins for the drugs. It should be practiced only if pregnant woman is constantly under the supervision of her doctor.

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Case of Herlyn–Werner–Wunderlich Syndrome

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INTRODUCTION

Uterus didelphys with obstructed hemivagina and ipsilateral renal agenesis is a rare congenital anomaly, referred to as Herlyn–Werner–Wunderlich syndrome (HWW). The exact incidence has been difficult to ascertain.[1] This syndrome was described for the first time in 1922 and was suspected in a young woman with regular menstruation and gradually increasing pelvic pain and a mass after menarche.[1,2] The exact cause, pathogenesis, and embryologic origin of HWW syndrome are uncertain, but the diagnosis and treatment of early stage can relieve acute symptoms and preserve normal fertility. The conventional treatment is not established, but it is sometimes reported that laparoscopy is needed for accurate diagnosis and treatment.[3] Septectomy and marsupialisation are considered the optimal management options.[4] If treatment is delayed, complications may develop, such as a hematometra or pyometra, hematosalpinx or pyosalpinx, emdometriosis, or pelvic adhesions, which in turn might cause obstruction of the genital organs.[5]

CASE REPORT

A 13 years old adolescent girl was admitted to the emergency department on 25/06/2011 complaining of severe abdominal pain that began 2 days previously. The patient achieved menarche before 6 months and had irregular menstruation with severe dysmenorrhea.

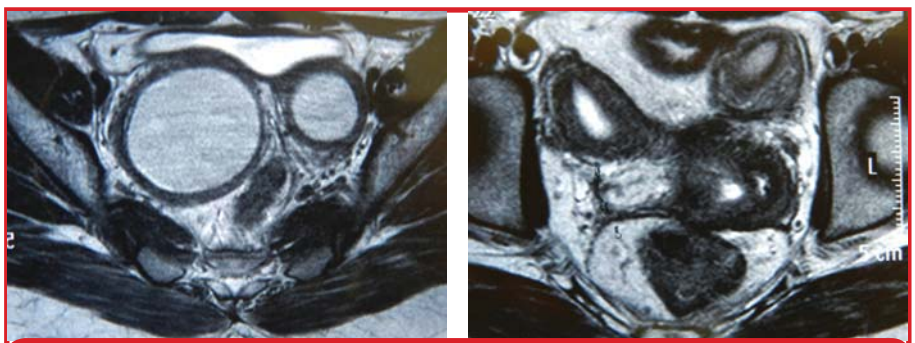
On physical examination, there was no specific findings, except lower abdominal tenderness. The cervix was visualized on left side speculum examination with hemiseptum of vagina on right. The bimanual examination revealed a protruding mass from the right vaginal wall with severe tenderness.

USG was suggestive of uterus didelphys with collection in right endometrial cavity of 11.6 x 5.9 cm noted in region of cervix and vagina with dense echos within it. Right renal agenesis with compensatory hypertrophy of left kidney was seen. IVP-confirmed absence of right kidney. MRI done-suggestive of uterus didelphys, bicollis, with collection in endometrial cavity on right side extending upto cervix and vagina. Both ovaries were normal, the right kidney was not visualised, and the left kidney was enlarged.

Patient was operated on 30.06.2011 EUA and drainage of hamatometra was scheduled. EUA revealed a vaginal hemiseptum on right attached to right vaginal wall and extending upto left cervix. Evidence of normal cervix on left with normal vagina.

Vaginal septum caught with the help of Allis forceps. Care taken not to injure bladder or rectum during the procedure. Before taking incision on the septum 18 cc spinal needle inserted through the septum and chocolate coloured fluid aspirated to confirm the contents.

A cruciate incision was made in the obstructed right vaginal septum and 300 cc of chocolate coloured fluid was extruded. A marsupialisation was performed. Hematometra was allowed



MRI Before Surgery MRI After Surgery

to drain. She was treated with antibiotics and was discharged without any specific complications on the 7th day after surgery. Per speculum examination on day 7 confirmed two normal cervical openings in the vagina. Repeat MRI on day 15 confirmed uterus didelphys, bicollis with right renal agenesis. Follow-up for 6 months shows normal regular mensus.

DISCUSSION

In this case of HWW syndrome, unilateral renal agenesis developed on the right side. The reported cases indicate that Mullerian anomalies develop more frequently on the right side twice as often as on the left side.[6] The patient complained of pelvic pain and dysmenorrhea, and the physical exam showed a vaginal or pelvic mass. The symptoms usually begin after the menarche. These patients usually menstruate normally and may have no specific symptoms, except dysmenorreha. Thus 20% of these patients are diagnosed in their 20s and 10% are diagnosed beyond age 30 years, but most often the diagnosis is made in adolescence.[4] As mentioned above, the clinical manifestations and physical findings are very helpful to diagnose this syndrome.

In addition, ultrasonography, computed tomography, MRI, hysterosalpingography, and exploratory laparoscopy are used, but MRI is the most effective method and helps to prevent unnecessary surgery.[7] MRI is more sensitive in detecting the uterine contour, the shape of the intrauterine cavity, and the character of the septum compared to the other modalities.

A septectomy and marsupialisation is more suitable treatment than a simple incision to maintain patency. The outcomes of pregnancy in these patients reveal 87% go on to have a successful pregnancy, while abortions occur in 23% of the patients, 15% have preterm births, and 62% have full-term pregnancies and uncomplicated deliveries.[4] We have experienced a case of HWW syndrome which was treated by a hemivaginal septectomy and marsupialisation and report this case with a brief review of the literature.

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Research of Intimate Partner Violence on Pregnant Chinese Women: 10 Years of Experience from the Domestic Harmony Research Team

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Unplanned pregnancy and partners who are unemployed or manual workers are two risk factors for intimate partner violence.

INTRODUCTION

Intimate partner violence (IPV) refers to the use of physical violence, sexual assault and/or emotional abuse, threats or coercive tactics by current or former intimate partners for the purpose of gaining power and control over a victim.[1] An intimate partner may be a spouse, cohabiting partner, boyfriend or dating partner. Previously, such violence was described as 'domestic violence'. The term *intimate partner violence* is now used in preference to domestic violence as the latter is not specific and may include child abuse, intimate partner violence and abuse of the elderly.[2]

Even though IPV is a universal phenomenon occurring in all countries irrespective of social, economic, religious or cultural backgrounds, victims and perpetrators are not homogeneous across cultures and ethnic groups. Hence the call for culturally sensitive research to address violence by an intimate partner.[3] Furthermore, information about IPV against Chinese women is also limited.[4]

Recognising the need for research into IPV victimisation against pregnant Chinese women, a group of researchers came together and formed the Domestic Harmony Research Team (DHRT) in Hong Kong. The team, which started with three obstetri-

cians in 1998, has since grown into a fully fledged research team of more than 20 members including obstetricians, paediatricians, nurses, social workers, sociologists, statisticians, lawyers and psychologists. In the past decade, the team has conducted research on the sensitive issue of partner violence in a population not known for divulging private details of family life to outsiders. Starting at a point where very little was known about IPV against pregnant Chinese women, the DHRT has gained important insights from the research conducted into the different aspects of IPV.

Taking stock of the DHRT's research activities in the past 10 years, a developmental account of the team's experience is described in this paper. The lessons learned by the team are also highlighted.

THE BEGINNING OF A JOURNEY

The first study on IPV against pregnant women in Hong Kong was conducted in 1998. The research idea originated from Professor HK Ma, who was Head of the Department of Obstetrics and Gynaecology at The University of Hong Kong, before her retirement in 1995. At that time there were no data on the prevalence of IPV against pregnant Chinese women. Identification of IPV was not included in an antenatal assessment unless there was a strong suspicion of abuse (such as multiple injuries which was rare). Based on the knowledge that 4% to 17% of pregnant women reported IPV victimisation in studies conducted in non-Chinese populations,[5,6] Dr WC Leung and his research team were keen to find out if similar prevalence rates would apply to pregnant Chinese women in Hong Kong.

Data collection for the first study on IPV against pregnant Chinese women[7] was undertaken from August to November 1998, in Tsan Yuk Hospital. Women attending their first antenatal clinic were invited to participate in the study, which had been approved by the Faculty Ethics Committee. A trained research nurse interviewed the women individually in a private room without the presence of their partners. The Abuse Assessment Screen (AAS),[8] which was translated into Chinese, was used to identify a history of abuse by an intimate partner against a woman, before and after her becoming pregnant. Included was an additional question asking abused women if they would like to report the abuse to their obstetrician or a medical social worker.

Of the 631 pregnant women interviewed, 113 (17.9%) reported a lifetime history of abuse, 99 (15.7%) were abused in the last year and 27 (4.3%) during the current pregnancy. The husband was the perpetrator in the majority of cases (86.9%). The nature of abuse was mainly psychological (96.3%) in the form of threats. No physical injury was reported. Risk factors for IPV during pregnancy included unplanned pregnancy, and unemployed or manual-worker partners. Unexpectedly, IPV was observed more commonly in local permanent residents rather than new immigrants from Mainland China. Interestingly, none of the abused women wished to reveal the abuse to their obstetricians and only two would consider telling it to a medical social worker.

This first local study on IPV against pregnant women revealed a prevalence rate similar to that of other countries.[9-12] However, the predominantly psychological nature of the abuse was not observed in the non-Chinese studies. Questions were thus raised: Is psychological abuse a unique feature of IPV against pregnant Chinese women? Would psychological abuse have an adverse effect on pregnancy outcomes?

EFFECT OF IPV ON PREGNANCY OUTCOMES IN CHINESE WOMEN

Subsequently, the same cohort of women was followed up and the effect of IPV on their pregnancy outcomes assessed. Data were successfully collected from 584 women, representing 92.6% of the original cohort. Of these, 93 (15.9%) were previously identified as having a history of IPV. No differences were found between the abused and non-abused women in terms of antenatal complications, including miscarriage, hyperemesis gravidarum, antepartum haemorrhage, hypertension and antepartum stillbirth. Similarly, no differences were found between the two groups in gestational age at delivery, mode of delivery, birthweight, Apgar scores and admission to a neonatal ICU.[13]

Given that the abuse was almost entirely psychological, it was hypothesised that the impact would be on the mental health of the women.

IPV AND MENTAL HEALTH IN PREGNANT CHINESE WOMEN

To test the relationship between IPV and mental health, the DHRT conducted a further study in the same hospital.[14] Data

were collected between October 2000 and February 2001 by the same research nurse using the AAS and Obstetrics Outcomes Checklist as in the previous two studies.[7,13] The Stein Daily Scoring System (SDSS) and the Edinburgh Postnatal Depression Scale (EPDS) were administered on day 2 or 3 post-delivery. The EPDS was repeated 1-2 days after discharge from hospital, and also at 6 weeks post-delivery. The SDSS was designed to measure maternity blues in puerperium, while the EPDS was used to screen postnatal depression.

A total of 838 women agreed to participate and were interviewed on day 2 or 3 post-delivery in the postnatal ward. Among the participants, 143 (17.1%) reported lifetime abuse, 139 (16.6%) were abused in the last year and 87 (10.4%) during the current pregnancy. While the prevalence rates were comparable to that of the first study, only 27.9% of the perpetrators were intimate partners and mothers-in-law accounted for 26.7% of the perpetrators. Again, the abuse reported was mainly psychological, and unplanned pregnancy was identified as a risk factor. Furthermore, no differences in pregnancy outcomes were found between abused and non-abused women as in the earlier study.[13] Significant differences, however, were observed in the SDSS and EPDS scores between the groups. Specifically, higher SDSS and EPDS scores were reported by those in the abused group at all data collection points.

The finding supported the DHRT's hypothesis that the effect of IPV against Chinese women, in which the nature of the abuse was almost entirely psychological, would be on their mental health. This was an important finding as it provided evidence between the association of IPV victimisation and mental health. The finding is also consistent with the literature, which suggests that emotional abuse, even in the absence of physical or sexual abuse, can contribute to mental health problems.[15,16]

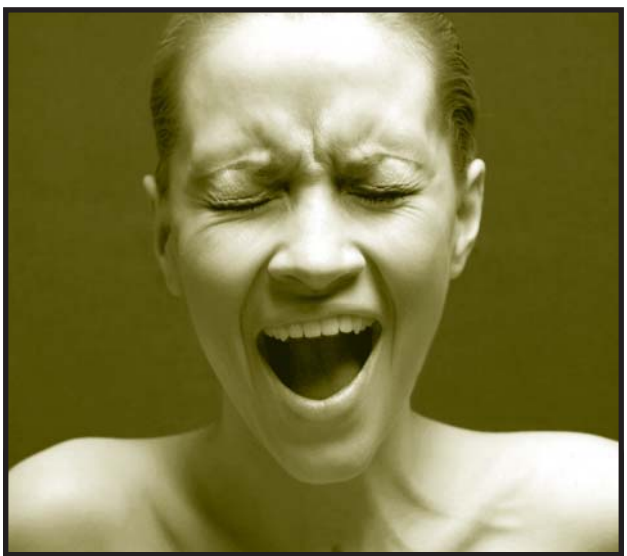
THE ASSOCIATION BETWEEN IPV AND QUALITY OF LIFE IN PREGNANT CHINESE WOMEN

IPV was also found to have an adverse effect on the quality of life of pregnant Chinese women. In a more recent study conducted by the DHRT,[17] 1,614 women were assessed for IPV victimisation (using the AAS) and for quality of life (using the WHO Quality of Life Measure). The participants consisted of 300 women seeking termination of pregnancy (TOP), 514 pregnant women, 300 general gynaecological patients and 500 subfertile women. Lifetime prevalence rates of IPV were 12.7%, 10.9%, 4.7% and 1.8% in the TOP group, pregnant women, general gynaecological patients and subfertile women, respectively. In the physical health, social relationship and psychological health domains of the Quality of Life scale, the mean scores of abused women, irrespective of their grouping, were significantly lower than that of non-abused women.

Despite the evidence demonstrating the adverse effect of IPV on Chinese women's mental health and quality of life, the call for screening pregnant women for IPV victimisation was met with scepticism in the absence of evidence-based interventions. Such concern is not unique to Hong Kong; similar concerns have been expressed elsewhere.[18] The scepticism prompted the DHRT to find a safe and effective intervention for pregnant Chinese women.

EVALUATION OF AN INTERVENTION FOR ABUSED PREGNANT CHINESE WOMEN

Using a randomised controlled trial, the DHRT evaluated an intervention for abused pregnant Chinese women in 2002-03. Of the 110 pregnant Chinese women who reported IPV victimisation, half were randomly assigned to an experimental group and half to a control group. Women in the experimental group received empowerment training based on an empowerment protocol[19] which was modified for Chinese abused women. With an emphasis on enhancing abused women's independence and control, the empowerment training sought to help abused women to develop safety plans, solve problems and make choices. These choices were made possible by providing the women with a better understanding of their own situations and informing them of community resources for abused women. An empathic understanding component based on Rogers' client-centred therapy[20] was also added to the empowerment protocol. The need for empathic understanding arose from the findings of the previous local studies in which abused women verbalised that their abusive experiences (which were predominantly psychological in nature) tended to be ignored by others. Thus, the need to take in and accept these women's perceptions and feelings was an important part of the intervention.



Intimate partner violence affects the mental health of abused women, contributing to mental health problems in their lives.

The 20-30 minute intervention was provided to each of the women in the experimental group once during pregnancy. Written information on the intervention in the form of a wallet-sized card was also provided to reinforce learning. Women in the control group received a wallet-sized card with information on community resources for abused women. At 6 weeks post-delivery, an experienced research nurse, who did not know if the woman belonged to the experimental or control group, conducted a post-intervention assessment by telephone. Outcome measures consisted of intimate partner violence (as on the Conflict Tactics Scale [CTS]), health-related quality of life (as on the Short Form Health Survey [SF-36]) and post-natal depression symptoms (as on the EPDS). Post-intervention, the experimental group reported significantly less psychological abuse and minor physical violence, improvement in physical functioning and role limitation, and lower postnatal depression scores compared with the women in the control group.[21]

The study provided much needed evidence on an empowerment intervention for abused pregnant Chinese women. However, before routine identification of IPV for pregnant women can be considered in Hong Kong, it is essential to have a measuring tool that is validated for pregnant Chinese women.

THE VALIDATION OF THE CHINESE ABUSE ASSESSMENT SCREEN

Although the AAS has been used extensively in the USA and internationally, the need to validate it in languages other than English has been emphasized.[22] Since the first study on IPV in pregnant Chinese women in 1998, modifications have been made to the Chinese version of the AAS based on field experience. The modifications are highlighted as follows.

Due to the predominance of psychological abuse observed in IPV against pregnant Chinese women, it is necessary to address psychological abuse and physical violence separately for all time periods (lifetime, preceding 12 months and during pregnancy) in the Chinese AAS (unlike the original English AAS). Also, as psychological abuse can be subtle and there is no widely accepted definition for it, examples of psychologically abusive behaviours are listed to help respondents to assess whether it is present in their intimate relationships. The examples were obtained from abused pregnant women who took part in previous local IPV research. The Chinese AAS is shown in Appendix 1.

To assess the measurement accuracy and utility of the Chinese AAS, it was administered to 100 pregnant and 157 non-pregnant Chinese women. Using the Chinese Revised Conflict Tactics Scale as the 'gold' standard, estimates of sensitivity, specificity, positive and negative predictive values, and positive and negative likelihood ratios of the Chinese AAS were assessed. The findings confirmed that the Chinese AAS has demonstrated overall satisfactory measurement accuracy and utility for identifying IPV against Chinese women.[23]

With the availability of a validated measurement tool and an evidence-based intervention for abused pregnant Chinese women, the stage was set for a territory-wide survey in order to assess the magnitude of IPV among pregnant women and determine the need for routine identification of IPV in antenatal assessment.

THE FIRST TERRITORY-WIDE SURVEY ON IPV AMONG PREGNANT WOMEN IN HONG KONG

From 1 July 2005 to 30 April 2006, 3,245 pregnant women attending antenatal clinics between their 32nd and 36th weeks of pregnancy, in six clusters of public hospitals, were assessed for IPV. A history of IPV victimisation

in the last year was reported by 296 (9.1%) women while 212 (6.5%) reported being abused since becoming pregnant. Among those who were abused in the last year, 216 (73%) experienced psychological abuse only, and 80 (27%) were physically and/or sexually abused. The Hong Kong West cluster was shown to have the lowest prevalence of IPV (4.2%). The remaining clusters showed a similar level of prevalence, averaging 9.1%. The prevalence of IPV since becoming pregnant was somewhat lower with an average of 6.5%. Again, the Hong Kong West cluster had the lowest rate at 3.3%, while the Kowloon Central cluster had the highest rate at 9.6%. Furthermore, the risk of being abused by an intimate partner varied significantly across the clusters. However, once controlled for socio-demographic factors such as being in debt, needing financial assistance, unplanned pregnancy and in-law conflict, no differences were observed.[24]

Consistent with the findings of previous local studies,[7,25] psychological abuse was the predominant form of abuse reported. In addition, women in the 'psychological abuse only' group had a higher risk of postnatal depression (adjusted OR 1.84, 95% CI 1.12-3.02) and a significantly poorer mental health-related quality of life ($p<0.001$) compared with non-abused women.

The territory-wide survey demonstrated that IPV against local pregnant women was prevalent. The adverse effect of IPV on abused women's mental health and mental health-related quality of life suggests that IPV is a public health problem among pregnant Chinese women, similar to that observed in studies conducted in other countries.[26]

LESSONS LEARNED FROM 10 YEARS OF IPV RESEARCH IN PREGNANT CHINESE WOMEN

Research into IPV against pregnant Chinese women has yielded important insights during the past 10 years. In a culture that is supposed to value harmony in interpersonal relationships, IPV victimisation of pregnant Chinese women is more prevalent than was realised. Also, psychological abuse is common and can occur in the absence of physical and/or sexual abuse. These findings have taught us that it is essential to measure the true extent of IPV during pregnancy in the local population so that appropriate intervention can be provided to ensure the health and well-being of abused women and their infants.

The observations relating to the predominance of psychological abuse, mother-in-law as perpetrator, and in-law conflict as risk factors of IPV in the pregnant Chinese population have reinforced the need for culturally sensitive research to address IPV, as advocated by other researchers.[27,28] Had the Chinese AAS not included items to assess for psychological abuse, it would not have been identified. It is therefore necessary and important that the methodology of IPV research be appropriate for the culture that is being studied in order to identify real cultural differences.

Despite the popular belief that partner violence is considered a family shame in the Chinese culture and should not be disclosed to outsiders, the DHRT has found that Chinese women were willing to discuss their abusive experience with a trained research nurse and accept professional advice from her. However, the revelation that the same women were reluctant to disclose abuse victimisation to their obstetricians is disconcerting. This points to the need for vigilance by health professionals during antenatal assessment. In the absence of routine identification for IPV in pregnancy, asking women directly about history of abuse by an intimate partner should be undertaken in selected cases (for example, those at risk of IPV).

The use of the Chinese AAS to measure IPV in pregnant Chinese women has shown that structured questions are useful in eliciting a history of abuse from these women. In addition, involving abused women in the development of the Chinese AAS has paid dividends. Examples of psychologically abusive behaviours as provided by these women have helped to enhance the validity of the Chinese AAS. However, there is still an ongoing need to enhance identification of sexual abuse using the Chinese AAS. This is a challenging undertaking as, despite their partners' sexually abusive behaviours, some Chinese women may still believe that sexual chastisement is part of their partners' marital prerogative. During the face-to-face contact in antenatal care, health professionals are in a good position to educate the women about their rights and how to protect themselves from their sexually abusive partners.

Finally, the 10 years of IPV research in pregnant Chinese women has shown that it is important to connect what is known about IPV to what can be done about it. In other words, findings from empirical research need to be applied to real-life settings. An example is the development

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and evaluation of an intervention based on the needs of abused pregnant Chinese women as described in this paper. In the future, in addition to increasing the quantity of evaluation efforts in IPV research, researcher-practitioner collaboration with the involvement of abused women should also be a priority.

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