

DIAGNOSTICS UPDATE .COM

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From my Keyboard



Pregnancy is a time in one's life that is extremely terrifying and awe-inspiring. Whether it is your first, second or sixth child, or whether you want to keep the baby or not the experiences are just as intense. After experiencing the whole nine months and through birth to holding my daughter, I have come to

appreciate the value of having the appropriate information around you throughout pregnancy. I was lucky to have had people around me to help with ideas and dispel my fears but other people are not as fortunate. As a result of this terrifying period that I went through, I decided to dedicate this issue of our newsletter to giving out some information to those of us planning to get pregnant, those already pregnant and those with newborns hoping that somewhere along the line the information becomes useful to someone. To the responsible men, this information is for you too as pregnancy is a greater challenge to you and you will be mercilessly judged by how you hold yourself together during this period. Wish you all the best as you go through this adventure and hopefully enjoy your little one at the end of it all!

I would like to acknowledge the articles submitted by DR JOHN B. EIGBE and DR BONIFACE B. OCHAYI, Drs. Gangopadhyay and K. Bhagat as well Seloi Mogatle Mpharm, their assistance is greatly appreciated. Those with articles they would like published, please do not hesitate to bring them forward.

As always your comments are welcome as they always make us bigger and better. Log on to www.diagnosticsupdate.com to get the online version of this newsletter or to contact us. More information on the tests can be found on www.diagnofirm.co.bw

Stay informed!
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Cllrs T. Pule and L. Serema with Mrs. B. Mmokele Lobatse town clerk and Mr and Mrs Chand look on as Mma Thebe shows off her blanket to beat the winter



DIAGNOFIRM MEDICAL LABORATORIES

by Sias Nuru

Recent Events @ Diagnofirm

Hello, we meet after yet another quarter of the year has passed by. With our consistency, you can use us as your official milestone to the year. We also have shown great consistency in our commitment to our social and scientific responsibilities.

This past quarter saw Diagnofirm involved in a number of activities. The first was the hosting of a Scientific presentation. This presentation was held to mark the launch of the Point Care CD4 analyser. This piece of machinery is essential to help deal with this scourge of HIV. It analyses CD4 cells and also gives the WBC count and differential. It is pretty new in the market, and ideal for rural settings where the CD4 count can be done whilst the patient waits and were the CD4 count is the only monitor as viral load is too

expensive. Diagnofirm is proud to have helped evaluate this machine as part of its contribution to the fight against HIV as a scourge and also as part of its scientific endeavours. The presentation also took the opportunity to introduce the PLG CD4 (pan leucogating) analysing system. This is a revolutionary system of more accurately estimating CD4 cells at a cheaper price.

Diagnofirm then donated blankets to the destitute and the marginalized in the Lobatse community. The donation was timely as it was presented during the rough winter days. Cllr Legobile Serema who received the blankets on behalf of the Mayor Rosemary Bosilong graced the occasion. It was also attended by Lobatse Town council welfare officer Ms. A. Ramabele who was

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PRE AND POST NATAL CARE

Every minute of everyday, somewhere in the world and mostly in the developing world a woman dies from complications arising from pregnancy or childbirth. That is 515000 women dying at the very least every year. For every woman who dies 30-50 women suffer injury, infection or disease related to pregnancy. Pregnancy related complications are among the leading causes of deaths and disability for women age 15-49 in developing countries. Research has shown that small and affordable measures can significantly reduce the health risk that women face when they have become pregnant. Most maternal deaths can be avoided if women have access to appropriate health care during pregnancy, child birth and immediately afterwards.

Each year approximately 4 million newborn babies die during the first month of life and an additional 4 million are stillborn. Nearly all these deaths occur in developing countries and most of these deaths can be prevented if good quality healthcare is available. Newborn survival is closely linked to the health of the mother before and during pregnancy as well as during labour, childbirth and the post partum period.

Early diagnosis of high risk pregnancy is important but of little value unless followed by normal attendance of antenatal care. The main aim of antenatal care is to assess the risk of harm to mother and baby and apply the appropriate level of surveillance or eradicate harmful effects. Postnatal care is essential in that after the successful pregnancy still no harm should come to the mother and the child as long as it is preventable.

Preconception care

This healthcare is offered to women contemplating pregnancy. Women are generally advised on the best nutrition to follow, diet control, weight control, regular exercise and discouragement from smoking, alcohol, and drugs. Certain foods like unpasteurised dairy products, soft cheeses, cold meats and raw seafood are discouraged. A medical examination, which should include blood pressure measurement, cardiac status assessment, urinalysis and a cervical smear, is recommended. Rubella serology as well as HIV serology should also be considered. Genetic counseling based on past obstetric or family history and advanced maternal age can also be included. This applies especially to Down syndrome, neural tube defect, congenital heart disease and cystic fibrosis.

CHECK POINT SUMMARY FOR PRECONCEPTUAL CARE

- 1- STOP SMOKING
- 2- STOP ALCOHOL AND OTHER SOCIAL DRUGS
- 3- REDUCE CAFFEINE INTAKE
- 4- FOLLOW A HEALTHY DIET
- 5- TAKE FOLIC ACID FOR 3 MONTHS PRIOR TO CONCEPTION
- 6- GOOD EXERCISE ROUTINE
- 7- ENSURE RUBELLA IMMUNITY
- 8- HAVE A BREAST CHECK AND A PAP SMEAR
- 9- EAT FRESHLY PREPARED FOOD
- 10- CONSIDER GENETIC AND FAMILY HISTORY.

PRENATAL CARE

Prenatal care refers to the regular check up recommended for women before and during pregnancy. The aim is to detect any potential problems early, to prevent them if possible and to direct the woman to the appropriate specialist if necessary. When conception is suspected to have happened, the pregnancy should be confirmed by urine or serum pregnancy test, a human chorionic gonadotropin (HCG) test if necessary. The previous obstetric history should be taken if no preconceptional care was given. This is done to note previous abortions, problematic pregnancies, and experiences with past pregnancies and hence prepare for the best assistance to the pregnant woman. The medical history should also be taken to check for past evidence of diabetes, tuberculosis, anaemia, rubella, renal and heart disease, blood transfusion and rhesus status. The psychosocial history should also be considered, as it is important to assess the emotional attitude of the mother-to-be.

Other issues to consider:

- 1- If maternal age >35years, Down syndrome screen
- 2- Unusual cases of nausea and vomiting
- 3- Possible exposure to rubella
- 4- If vaginal bleeding, and Rhesus negative, a test for rhesus antibodies will be required.

On the first visit to the doctor, the weight, height, blood pressure, pulse will be measured and a urinalysis test ordered.

The routine first antenatal visit will require the following tests:

- 1- Full blood count
- 2- ABO blood group and rhesus status
- 3- Rubella antibody status
- 4- Cervical cytology
- 5- Hepatitis B virus serology
- 6- HIV serology
- 7- Syphilis serology
- 8- Cytomegalo virus serology
- 9- Toxoplasma antibody status
- 10- Hepatitis C virus serology
- 11- Blood glucose levels
- 12- For patient older than 35 years, Down syndrome screen.

Below is a summary of standard antenatal visits practice:

- 1- Initial visit 8-10 weeks pregnant
- 2- Upto 28 weeks: every 4-6 weeks
- 3- Upto 36 weeks; every 2 weeks
- 4- 36 weeks to delivery: weekly.

For each visit the following will be recorded:

- A- Weight gain
- B- Blood pressure
- C- Urinalysis results
- D- Uterine size

- E. Foetal heart beat
- F. Foetal movements
- G. Presentation and position of the baby especially 3rd trimester.

With full intervention and proper medical care and no other serious complications, with religious following of the prenatal care protocol a lot of conditions can be overcome and the pregnancy taken to full term.

POSTNATAL CARE

Post natal education should be offered to a woman during pregnancy so that she will be familiar with the basic principles of motherhood especially breastfeeding. Postnatal care really begins with the birth of the baby. Once the gynaecologist and the paediatrician ascertain that both the mother and the baby are fine, they are discharged from hospital.

After 2 weeks a doctor's visit is done. The mother is examined to assess:

- 1- Coping ability
- 2- Signs and symptoms of postnatal depression
- 3- Breastfeeding ability
- 4- The need for any extra encouragement and advice.

The baby is offered routine physical examination to confirm proper function of all the body organs.

After 6 weeks another doctor's visit should be conducted. The mother is checked for the following:

- a- Pap smear
- b- Rubella status
- c- Adequate contraception
- d- If intercourse has resumed and proper advice given
- e- Bowel and urine control
- f- Weight, blood pressure and urine content
- g- Psychological health
- h- Adequate diet, rest and personal care.

The baby should be offered:

- a- A routine medical check-up
- b- A check for growth and feeding.
- c- An evaluation regarding immunization.

All these services suggested are meant to increase the chances that the pregnancy is successful and both the mother and the baby make it alive through the nine months. Always seek professional help and advice when in doubt and do not risk your pregnancy. ■

ECTOPIC PREGNANCY: CASE PRESENTATION

M.M is a 32-year-old Para 1+0 whose last childbirth was ten years ago, brought to our surgery having collapsed in her office following episode of intermittent bleeding per vaginam and lower abdominal pain for four weeks prior to presentation. She denied any history of amenorrhoea or vaginal discharge. She claimed to have been taking some traditional concoction because of above complaints without improvement and also had used hormonal pills to control the bleeding.

On examination, she was fully conscious and well orientated in time, place and person, but markedly pale with a pulse rate of 93 beats per minute but of poor volume and regular. Blood pressure was 103/68 mmHg in supine position. She had 1st and 2nd heart sounds only.

Abdominal examination revealed a tender suprapubic mass. Other systemic examination was essentially normal. Because of the patient's clinical state, abdomino-pelvic ultrasound was done which revealed gestational sac with foetal pole and cardiac activity with estimated gestational age of 10 weeks 4 days old at the right adnexia, adjacent to a bulky empty uterus. No fluid collection was seen in the pouch of Douglas. Based on working diagnosis of ectopic gestation (pregnancy), she was promptly resuscitated and referred to the district hospital. At the hospital, she had laparotomy with salpingectomy. She had uneventful postoperative recovery and was subsequently discharged.

DISCUSSION

Ectopic pregnancy presents a major health problem for women of childbearing age. It is the result of implantation of fertilized ovum outside of the uterine cavity, which ultimately ends in the demise of the fetus. The fertilized ovum is implanted in the cervix, fallopian tube, ovary, and abdominal or pelvic cavity. At least more than 80% of ectopic pregnancy occurs in a uterine tube. Without timely diagnosis and treatment, ectopic pregnancy can be a life-threatening situation as we can see in the case of M.M. above. The incidence is about 1 per 100 to 200 diagnosed pregnancies.

RISK FACTORS

Age.

The highest rate of ectopic pregnancy occurs in women aged 35-44 years. A 3- to 4-fold

increase in the risk for developing an ectopic pregnancy exists in this age group compared to women aged 15-24 years. One proposed explanation involves the propelling activity in the fallopian tube, which is responsible for tubal motility. Aging may result in a progressive loss of these activities along the fallopian tube facilitating implantation along the fallopian tube.

Pelvic inflammatory disease.

Pelvic inflammatory disease due to *Chlamydia trachomatis* or *Neisseria gonorrhoea* increases the risk of ectopic pregnancy by four fold. Majority of women with these infections are unaware of the exposure. A history of pelvic inflammatory disease (PID) increases the risk of ectopic pregnancy 4-fold. The incidence of tubal damage increases after successive episodes of PID (i.e., 13% after 1st episode, 35% after 2nd, 75% after 3rd episodes).

Prior history of ectopic pregnancy

After 1 ectopic pregnancy, a patient incurs a 7- to 13-fold increase in the likelihood of another ectopic pregnancy with overall 10-25% chance of having ectopic pregnancy.

Others

Other risk factors include, history of tubal surgery and conception after tubal ligation, use of fertility drugs (drugs used for ovulation induction) such as clomiphene citrate or assisted reproduction technology, smoking and use of intrauterine contraceptive device (IUCD).

Presentations

Most ectopic pregnancies are located in the fallopian tube. The most common sites are ampullary portion of the tube (80%), Isthmus segment of the tube (12%), the fimbria (5%), and the cornual and interstitial region of the tube (2%). Non-tubal sites of ectopic pregnancy are a rare occurrence, with abdominal pregnancies accounting for 1.4% of ectopic pregnancies and ovarian and cervical sites accounting for 0.2% each.

Classical clinical triads of ectopic pregnancy are pain, amenorrhoea (failure of normal menses to occur) and vaginal bleeding. Only 50% of the patient present

Jokes Corner

The prison hospital

Prisoner: Look here, doctor! You've already removed my spleen, tonsils, adenoids, and one of my kidneys. I only came to see if you could get me out of this place!

Doctor: I am, bit by bit.

How much will this cost me?

Patient: How much to have this tooth pulled?

Dentist: \$100.00.

Patient: \$100.00 for just a few minutes work?

Dentist: Well, I can extract it very slowly if you like.

Will I live any longer?

Patient: Doctor, if I give up wine, women, and song, will I live longer?

Doctor: Not really. It will just seem longer.

Want to lose some weight

A man, seeking to lose some of his excess weight, visited the local doctor.

John: How can I lose twelve pounds of ugly fat?

Doctor: Of course! Cut your head off.

A doctor is complaining to a mechanic

A doctor is talking to a car mechanic, "Your fee is several times more per hour than we get paid for medical care."

"Yeah, but you see, doc, you have always the same model, it hasn't changed since Adam; but we have to keep up to date with new models coming every month."

A very interesting fact

Doctor: Did you know that there are more than 1,000 bones in the human body?

Larry: Shhh, doctor! There are three dogs outside in the waiting room!

We are the best of friends

The patient shook his doctor's hand in gratitude and said, "Since we are the best of friends, I would not want to insult you by offering payment. But I would like for you to know that I had mentioned you in my will."

"That is very kind of you," said the doctor emotionally, and then added, "Can I see that prescription I just gave you? I'd like to make a little change."

1 woman walked up to a little old man rocking in a chair on his porch. "I couldn't help noticing how happy you look," she said. "What's your secret for a long happy life?"

"I smoke three packs of cigarettes a day," he said. "I also drink a case of whiskey a week, eat fatty foods, and never exercise."

"That's amazing," the woman said. "How old are you?" "Twenty-six," he said.

2 A male gynecologist is like an auto mechanic who never owned a car.

3 What do you get if you cross a Dentist with a Podiatrist?
A doctor who specializes in foot-in-mouth disease.

4 If you want your wife to listen and pay undivided attention to every word you say, talk in your sleep.

typically. Other features include lower abdominal mass (50%), abdominal tenderness (75%), haemodynamic compromise, (ranging from weakness, thirst, profuse perspiration, shock), sub-diaphragmatic pain, or sharp shoulder pain with extensive intra-abdominal bleeding.

Differential diagnoses are appendicitis, pelvic inflammatory disease, ruptured corpus luteum cyst, spontaneous abortion, ovarian cyst torsion, and urinary tract infection.

Ultrasound is the most important tool in the diagnosis of extra uterine pregnancy. Visualization of gestational sac outside the uterus with or without fetal cardiac activity is diagnostic. However absence of the above sign does not exclude ectopic gestation especially in the presence of positive pregnancy test and empty uterine cavity. Color-flow Doppler Ultrasound has been demonstrated to improve the diagnostic sensitivity and specificity with the aid of transvaginal Ultrasound probe, especially in cases where a gestational sac is questionable or absent. Pregnancy test using assay of b-HCG is a valuable office procedure and will only confirm the presence of pregnancy but will not rule out ectopic gestation.

Laparoscopy in a patient that is haemodynamically stable allows assessment of the pelvic structure, size and exact location of ectopic pregnancy and presence of haemoperitoneum (blood in the abdominal cavity). It also provides option of treatment once diagnosis is made.

TREATMENT.

Emergency treatment includes immediate surgery when diagnosis of ectopic pregnancy is made. Transfusion of whole blood as soon as possible when the patient is in shock and administration of other antishock measures including keeping the patient warm and giving of oxygen should be instituted.

Medical treatment is appealing over surgical option for a number of reasons: it eliminates morbidity from surgery, general anaesthesia, loss of fallopian tube and cost of hospitalization. The use of methotrexate has been advocated in hemodynamically stable, reliable and compliant patients with gestational sac of less than 3.5cm (confirmed by ultrasound measurement which shows absence of fetal cardiac activity). Also there should be no contraindication to methotrexate therapy.

But most of the patients presenting with ectopic pregnancy in developing country ended up with salpingectomy (excision and ligation of the fallopian tube) due to late presentation. Where ability to make early diagnosis and microsurgical technique exist, conservative surgery is the best surgical option such as salpingostomy and evacuation of product of conception. This procedure helps to preserve the affected tube and brighten the chance of future reconstructive surgery.

COMPLICATION.

This could be due to late diagnosis, misdiagnosis or method of treatment. Some of the complications include massive hemorrhage, which could lead to shock, disseminated intravascular coagulopathy (DIC), and death. Chronic salpingitis could follow neglected ruptured ectopic pregnancy. Late complication include secondary infertility.

PREVENTION.

Treat pelvic inflammatory disease early and vigorously and avoid adhesion surgery. Early diagnosis of unruptured ectopic pregnancy will prevent extensive surgery. Most of the ectopic pregnancies other than the tubal are not preventable.

CONCLUSION:

Ectopic pregnancy is a common gynecological emergency in our environment due to prevailing risk factors. The need for high index of suspicion will enhance early diagnosis and prompt intervention to minimize the mortality and morbidity associated with ectopic gestation.

Effective management of pelvic inflammatory infection will go a long way in reducing the incidence of ectopic gestation in our community. ■

DID YOU KNOW THAT...

- A fetus in the womb can hear. Tests have shown that fetuses respond to various sounds just as vigorously as they respond to pressures and internal sensations.
- A four month old fetus will startle and turn away if a bright light is flashed on it's mother's belly.
- Babies in the womb will also react to sudden loud noises, even if their mother's ears are muffled.
- Children born in the month of May are on the average 200 grams heavier at birth than children born in any other month.
- During pregnancy a woman's blood volume increases up to 50%. In addition to meeting the needs of the fetus, this is a reserve against fluid loss that occurs during childbirth.

Pregnancy issues

Fluids

Increasing your fluid intake is important in pregnancy in order to keep the body well hydrated. This is especially true while you're exercising. Of course, your bladder may not handle this situation, and you'll need to urinate frequently. Drinking 8-12 cups of liquid a day, but be careful for drinking juices – they have a lot of calories and can contribute to excessive weight gain. Dilute juices with water, or switch to water altogether. Avoid soft drinks and diet drinks, and limit drinks with caffeine.

Vitamin Supplements

If you are vegetarian and not eating dairy, fish or eggs, Vitamin B-12, calcium and Vitamin D may be necessary. Iron is often advised during pregnancy to help your body manufacture hemoglobin to produce new blood cells for you and the baby. If you are anaemic, you will need more iron than most prenatal vitamins supply.

Caffeine

Keep in mind that caffeine is a stimulant that does cross the placenta. Caffeine in limited amounts is probably safe during pregnancy, but limit yourself to no more than two cups of coffee, tea a day. Also remember that drinking caffeine may interfere with your ability to fall asleep.

Fish Consumption

If you're pregnant or lactating, avoid consuming large amounts of ocean fish due to concerns about mercury contamination, which can cause harm to the nervous system of a developing baby. Avoid shark, swordfish, king mackerel, tilefish and limit tuna and canned fish.

Food Safety

Pregnancy is a time to be especially aware of food contamination and safety. If you're unsure if a food is spoiled or contaminated, don't take any chances. Handwashing is especially important during food preparation. Work surfaces and utensils should be cleaned with soap and warm water with each use, especially when preparing raw meat or eggs.

Foods to avoid include:

- Uncooked or rare meats
- Uncooked seafood or shellfish
- Foods containing raw or undercooked eggs
- Alfalfa and other sprouts,
- Unpasteurized milk products and juices
- Soft cheese

Packaged foods and 'junk foods' have artificial flavours, colors and preservatives—they're often high in calories and low in nutrition. It's best to minimize your intake of these foods, and choose more natural

foods with higher nutritional value. The good habits you develop in pregnancy will be ones to pass on to your growing child later on.

Smoking and pregnancy

Smoking by pregnant women may result in fetal injury, premature birth, and low birth weight. Pregnant smokers have a higher chance of miscarriage and stillbirth. Babies of smoking mothers have a higher chance of being born early and too small. Low-birth-weight babies can suffer serious health problems throughout their lives. Tobacco smoke contains nicotine, arsenic, various tar products, and carbon monoxide. All of these are damaging to the body, and all of them can reach the baby through the placenta.

Smoking during pregnancy may limit blood flow through the placenta and thus slow the baby's growth.

Alcohol and pregnancy

When you eat or drink, so does your baby. Food and drink quickly enter your baby's bloodstream through the placenta. Drinking alcohol during pregnancy can cause fetal alcohol syndrome (FAS). FAS is a group of mental and physical defects such as mental retardation, heart defects, and cleft palate. This also includes defects of the face, fingers, arms, and legs. Children with FAS often are hyperactive and have limited attention spans. FAS children can suffer lifelong illness because of their mother's use of alcohol.

Drinking during the first three months of pregnancy is particularly dangerous. This is the most important time for the baby's organs (including the brain, heart, and lungs) to grow. For this reason, you should stop alcohol use if you are planning to become pregnant.

Drugs and pregnancy

The average medicine cabinet has cold tablets, aspirin, allergy pills, and other over-the-counter medicine, as well as prescription drugs. You must remember now that the medicine you take can affect your baby. Because some medicines can harm your baby, you should ask your doctor before you take anything. Aspirin – can be harmful, especially when large amounts are taken in late pregnancy. Both mother and baby may experience abnormal bleeding during delivery. Tranquilizers – an increased chance of cleft palate or cleft lip has been linked to some tranquilizers. Caffeine – although not usually thought of as a drug, this ingredient found in coffee, tea, chocolate, cola, and some pain medicines has caused birth defects.

Vitamins – only take what your doctor

tells you to. Large doses of some vitamins, such as vitamin A, can cause birth defects.

Illegal drugs and pregnancy

Babies born to mothers using street drugs often are born smaller and too early. And they tend to experience behavioral problems such as hyperactivity.

Sex in pregnancy

Coitus should be encouraged during pregnancy but with appropriate care especially in the last four weeks before delivery. Restrictions would only be seen necessary if there has been an adverse obstetric history and there are major complications in the current pregnancy.

Travel

Pregnant women should not stand in buses or anywhere for long periods of time. They should avoid international air travel after 28 weeks and air travel after 36 weeks is prohibited.

Weight gain

Do not diet to lose weight when pregnant. It is normal to gain up to 20kg without adverse effects.

Pregnancy sickness

Nausea and vomiting occur in more than 50% of cases and almost always disappear by the end of the 1st trimester.

Heartburn

Gastro-oesophageal reflux is a major source of discomfort in the later half of the pregnancy. One is advised to eat more frequent small meals, avoidance of bending over and elevate the head when sleeping.

Cramps

Pregnant women are very prone to cramps. Simply place a pillow at the foot of the bed to elevate legs.

Haemorrhoids

These are very troublesome during the later stages of the pregnancy. A high fibre diet will help alleviate the problem.

Dental hygiene

Dental problems can worsen during pregnancy so special care of teeth and gums is appropriate. Use a softer brush when cleaning teeth. ■

Highly Active Antiretroviral Therapy and Lactic Acidosis

Lactic acidosis is a serious side effect of the nucleoside analogue class of anti-HIV drugs (NRTIs such as AZT, D4T, etc). Although extremely rare, when it does occur there is a high chance of death, even if it is treated immediately. Lactic acidosis may occur in conjunction with severe hepatomegaly.

Lactate or lactic acid is the end product of glucose breakdown in the body. Lactic acidosis is the condition caused by overaccumulation of lactate in the body, which the liver is unable to clear. An abnormal accumulation of lactic acid in the blood, also known as "hyperlactataemia" or lactic acidemia, develops prior to lactic acidosis. Lactic acidemia may be associated with symptoms such as fatigue, breathlessness, abdominal pain and weight loss.

Lactic acidosis is thought to be the most severe side effect of damage to mitochondrial DNA within human cells caused by NRTIs. Other NRTI-related side effects associated with damage to the mitochondrial DNA include neuropathy, bone marrow suppression, liver and pancreatic damage, and lipodystrophy.

Studies indicate that between 30-60% of people on NRTI therapy have elevated levels of lactate in their blood, although levels are rarely high enough to induce symptoms of lactic acidosis. A recent French study reported that 0.8% of patients taking anti-HIV drugs develop symptoms of high lactate each year. A raised lactate level without acidosis is of uncertain significance. One raised lactic level is poorly predictive of continuing rises in lactate levels on follow-up or the development of acidosis. The syndrome of lactic acidosis is rare and occurs only in 4/1000 patient-years of follow-up. It is predominantly seen in over-weight women, particularly those given stavudine/didanosine combinations. An important precipitating factor might be infection. The syndrome has a high case fatality rate and there is no known treatment. The syndrome is difficult to recognize, as premonitory features are vague, including abdominal distension and vague gastrointestinal upsets. Sometimes people present simply with unexpected weight loss. A high clinical index of suspicion of the possibility of this diagnosis is therefore required.

RISK FACTORS FOR LACTIC ACIDOSIS

Long-term anti-retroviral usage increases the person's risk of lactic acidosis. Elevated lactate levels have been associated also with elevated cholesterol and triglyceride levels in patients receiving anti-retroviral therapy, but not in untreated people. Consequently, lactic acidosis has been linked to body fat and metabolic changes seen amongst people on highly active anti-retroviral therapy. However, this link remains disputed.

As discussed above, lactic acidosis has been associated with the nucleoside analogue class of drugs. All NRTIs have been implicated although there have been suggestions that the thymidine analogues, AZT and D4T, are more likely to cause the side effect. Several recent reports have linked D4T and DDI most closely with lactic acidosis. In a study in 31 patients identified as having hyperlactatemia, it was found that the risk of developing high lactate was 147 fold higher in those who received D4T, DDI and abacavir compared with those who received AZT/3TC.

Conflicting data are available on the impact of gender on development of lactic acidosis. Pregnant women taking DDI and D4T may be at an increased risk of lactic acidosis according to the US FDA. Obesity has been linked to increased risk of acidosis, as has severe infection or malnutrition. Although it has been suggested that lactic acidosis may be associated with mitochondrial toxicity in muscle tissue (since lactate is produced by muscle tissue during exercise), there is no evidence that exercise will worsen lactate levels in HIV positive people. Elevated lactate levels are probably a consequence of liver dysfunction, experts believe.

SYMPTOMS

Initial symptoms of high lactate levels include general gastrointestinal symptoms such as nausea, lack of appetite and malaise as well as fatigue and difficult in breathing. Muscle pain and numbness or tingling sensations have also been reported. In lactic acidosis the liver may be swollen and tender, and liver enzymes may be elevated. Symptoms of acute lactic acidosis include difficult in breathing and hyperventilation.

Laboratory findings may include low bicarbonate, raised lactate, modest elevations in liver enzymes and

transaminases, and deteriorating renal function. Plasma bicarbonate and blood PH are quite low, indicative of the presence of severe metabolic acidosis. There could be an elevation of plasma glucose as well as an elevation of the serum anion gap. The anion gap is measured as serum sodium minus the sum of chloride and bicarbonate anions (in mmol/L) and this should be no greater than 15 (12 ± 2). However, the serum anion gap may not always be raised in lactic acidosis. As discussed before, there could be elevations in the serum cholesterol and triglyceride levels. Ketones in the urine should always be checked to rule out other causes of metabolic acidosis. The normal lactic acid levels in venous blood is between 0.5-2mm/L.

MONITORING

To date, there are no lab tests, which clearly predicts who is at risk of lactic acidosis.

Measuring lactic acid or serum lactate has been suggested although its usefulness has not been established. Elevated levels of lactate were poorly predictive of a subsequent elevated plasma lactate; only 38% of elevated lactates were followed by a second elevated lactate. The rate of hyperlactatemia was greatest in those receiving D4T and DDI together. Combined use of abacavir and 3TC, and D4T and 3TC, were associated with a reduced risk of hyperlactatemia compared to D4T and DDI.

Hyperlactatemia was also associated with elevation of the liver enzyme ALT and of plasma glucose.

The researchers who have linked lactic acidosis to lipodystrophy have suggested that C-peptide (a by-product of the pancreas linked to insulin production) and liver function results may be elevated in people with this syndrome. However, given that the relationship between lipodystrophy and lactic acidosis remains theoretical, monitoring C-peptide and liver function should be regarded as experimental.

Elevated lactate levels has been strongly associated with the development of fat wasting in several studies;

TREATMENT

The suggested guidelines for management of elevated lactate levels are as follows:

- Individuals with lactate levels greater

than 10mmol/L should be taken off nucleoside analogue treatment immediately; at this level individuals are likely to have symptoms and have a high risk of dying if treatment is not discontinued promptly.

- Individuals with lactate levels between 5-10mmol/L should be taken off treatment unless other cause of elevated lactate levels can be identified, but those without symptoms who have lactate levels above 5mmol/L should be retested, since this measurement may be a testing error (lactate above this level without symptoms is unusual).
- Symptoms with lactate levels between 2-5mmol/L; investigate other causes before discontinuing therapy.

Lactate levels may take some months to fall towards normal, suggesting that abnormal lactate production by damaged mitochondria takes some time to put right. Carnitine and vitamins may stabilize lactate levels among people with mild elevations who continue NRTI treatment. The long-term consequences of large elevations in lactate levels for those with pre-existing liver damage is unknown. The syndrome has a high case fatality rate. A variety of co-factors important in mitochondrial metabolism, including riboflavin and substance Q, have been tried with inconclusive results. While haemoperfusion reduces the acid-base disturbance, survival will only occur with liver recovery.

If they should recover from lactic acidosis, the optimum choice of anti-viral therapy is difficult. *In vitro* experiments, suggests that some NRTIs may be less likely to produce the syndrome of lactic acidosis than others. Thus lamivudine and tenofovir may be the safest in this regard. ■

Erythropoietin therapy to treat Anaemia in Chronic Heart Failure

Anaemia has been found to affect nearly a quarter of heart failure patients. It is associated with a worse prognosis, an increased risk of hospitalisation and reduced exercise tolerance. Although the mechanism is unclear early reports suggest there may be some benefit to correction of anaemia by erythropoietin therapy. We await the outcomes of randomised controlled trials to know if this line of treatment is effective.

Introduction

Chronic heart failure (CHF) is a multi-organ syndrome with changes in the periphery affecting muscle and blood vessels, neurohormonal activation and metabolic and hormonal changes. It is now recognised that anaemia is also frequently part of this syndrome.

Epidemiology and pathophysiology

- If we define anaemia as a haemoglobin (Hb), less than 12.0g/dl anaemia affects between 10-25% of CHF patients with more in the sicker patients' population.
- The cause of anaemia in chronic heart failure is not known.
- In many cases anaemia in chronic failure shows similarities to the anaemia of chronic disorders, in which there is a defect in iron utilisation.
- The commonly recognised causes of anaemia in a general population such as iron, folate or B12 deficiency can exist in CHF and should be looked for.
- Blood loss can also be excessive in patients on anti-platelet and/or anticoagulant regimes for their primary cardiovascular disorder.
- In most CHF cases with anaemia, however, there is no identifiable cause.
- Aetiological factors are thought to include bone marrow dysfunction secondary to poor perfusion, impaired renal function and the effects of cytokine activation -especially TNF-alpha- which can induce both reduced erythropoietin production and increased resistance to its effects.
- In severe heart failure immune activation and pro-inflammatory cytokines correlate strongly with the severity of anaemia.

Consequences

Anemia has an independent effect on

exercise intolerance by further reducing an already impaired oxygen delivery to the exercising muscle groups.

Studies in large heart failure populations including cohorts from several of the large outcome trials in CHF have shown an independent detrimental effect of anaemia on the risk of death or admission to hospital for worsening heart failure.

These findings suggest that treatment of anaemia might have the potential to improve outcomes.

Treatment

Where an identifiable cause of anaemia in chronic heart failure is found it should be treated appropriately.

We know that both erythropoietin or IV Iron treatment can increase haemoglobin levels in CHF and in early reports this has been associated with improved well-being and exercise tolerance.

Whether this is with an acceptable safety profile and indeed whether it reduces the risk of mortality and morbidity is presently unknown. This exciting new treatment option awaits proper randomised outcome trials in the next few years.

References

1. Wexler D, Silverberg D, Sheps D, Blum M, Keren G, Isina A, Schwartz D. Prevalence of anemia in patients admitted to hospital with a primary diagnosis of congestive heart failure. *Int J Cardiol.* 2004 Jul;96(1):79-87.
2. Sharma R, Francis DP, Pitt B, Poole-Wilson PA, Coats AJ, Anker SD. Haemoglobin predicts survival in patients with chronic heart failure: a substudy of the ELITE II trial. *Eur Heart J.* 2004 Jun;25(12):1021-8
3. Mancini DM, Katz SD, Lang CC, LaManca J, Hudeibeh A, Androne AS. Effect of erythropoietin on exercise capacity in patients with moderate to severe chronic heart failure. *Circulation.* 2003 Jan 21;107(2):294-9.
4. Mix TC, Brenner RM, Cooper ME, et al. Rationale—Trial to Reduce Cardiovascular Events with Aranesp Therapy (TREAT): evolving the management of cardiovascular risk in patients with chronic kidney disease. *Am Heart J.* 2005 Mar;149(3):408-13 ■

Continued from page 1

Recent Events @Diagnofirm

the Director of ceremonies, Town Clerk Ms. B. Mmokele, Clr T. Pule, Director of DML Mr. M.I. Chand, his wife and his uncle Mr. Naseer Chand Managing Director of K&N Furnishers, Manager Desire Mhlabi, Olebogeng, MaMudenda, and the accountant Maran represented Diagnofirm staff.

In a her vote of thanks, the Town Clerk, commended Diagnofirm for its noble gesture and quoted J.F. Kennedy in saying 'the success of nation building lies in focusing on what individuals can do for the country and not what the country can do for them'.

Still in the same breath, the Diagnofirm goodwill and assistance mission touched Tonota village with the donation of food hampers to the underprivileged. The donation ceremony was preceded by the fun attraction provided of the Tonota Festival of Light and Hope soccer match between PSL champions Township Rollers and a Tonota soccer team sponsored by Diagnofirm, this match ended in a very exciting draw. Tonota village's Kgosi Radipitse, DML Director Mr M. I. Chand and his wife Mrs W. Chand, Mr Aanish from Choppies, David Mmoi Township Rollers Chairman and village elders graced the occasion. The event was coordinated by Maokaneng and Mr Chand and was a joint effort between Diagnofirm Choppies and Township Rollers for the benefit of Tonota village. Nicholas Mburugu and Blessing Kadira represented Diagnofirm staff from the Selebi-Phikwe branch with Mula Moyo and Silas Nunu coming from the Gaborone Main Lab.

Both these donations are a mark of the fulfillment of Diagnofirm's social responsibilities which have extended as far afield as Moshupa, Selebi-Phikwe, Kanye and Gaborone. We hope to continue all this into the next quarter of the year and give the needy some Christmas cheer. So till our next issue enjoy life and your health. ■

Photo Break....



Mr. Kematlamang Morake giving his vote of thanks after the donation in Tonota



Bozo, Marang and Ank Gowans from Beckman and Coulter during the presentation for the point-care CD4 analyser



Desire and Phillmon from Beckman and Coulter share a joke



Mr. Chand and Township Rollers Chairman Mr. David Mmoi during the Tonota presentation

Photo Break....



From left to right; Mma Mudenda, Mma Thebe Cllr. L. Serema and Mr. Chand in Lobatse



Left to right; cllr. T. Pule, Mrs Chand, Mma Thebe, Mr. Chand, Mrs B. Mmokele and Cllr. L. Serema



Silas and Mula pose with the food hampers



Mula, Silas and Booker help some of the elders carry their goodies



Kgosi Radipitse of Tonota giving his speech stating that the time is NOW to know your HIV Status



Some of the Tonota elders listening attentively



From left to right; Booker, Mula, Nicholas, Silas, Mr. Chand, Max and Mrs Chand in Tonota



Diagnofirm staff with the Diagnofirm sponsored Tonota soccer team

Childhood diseases and Immunisation

Immunisation is a safe and effective way of protecting children against certain diseases. The risks of these diseases affecting your child are far much greater than the very small risks of immunizing the baby. Immunisation protects the baby against harmful infections before the baby gets the disease from the community. The procedure uses the body's natural defence mechanism, the immune response, to help the child build resistance to specific infections. Nine diseases of childhood can be prevented by immunisation. These are diphtheria, tetanus, whooping cough, polio, measles, mumps, rubella, Haemophilus influenzae type B (Hib) and hepatitis B. These diseases can cause serious complications or even death.

Immunisation is given as an injection or, in the case of polio vaccine, taken as drops by mouth. All forms of immunisation work in the same way. When someone is injected with, or swallows a vaccine, their body produces an immune response in the same way it would follow exposure to a disease but without the person getting the disease. If the person comes into contact with the disease in the future, the body is able to make an immune response fast enough to prevent the person getting sick. Some vaccines contain a very small dose of live, but weakened form of a virus, some contain a small dose of killed bacteria or small parts of the bacteria and others contain a small dose of a modified toxin produced by the bacteria.

Normal response to a vaccine takes several weeks and hence protection from a vaccine does not occur immediately after vaccination and most immunizations need to be given several times to build a long lasting protection. Booster doses are needed because immunity decreases over time. A number of immunizations are required in the first few years of a child's life to protect the child against the most serious of infections. The immune system in young children does not work as that of adults because it is still immature. In the first months of life the baby is protected from infections by antibodies from her or his mother, which are transferred to the baby during pregnancy. When these antibodies wear off, the baby is at risk of serious infections and so the first immunizations are given before these antibodies have gone.

Common side effects of immunisation are redness and pain at the site of injection

and mild fever. While these symptoms may concern you and upset your child at the time, the benefit of immunisation is protection from the disease. Paracetamol might be required to help ease the fever and the soreness. There are two reasons for immunizing every child: 1- Immunisation is the safest and most effective way of giving protection against the disease. After immunisation, the child is far less likely to catch the disease if there are cases in the community. 2- If enough people are immunized in the community, the infection can no longer be spread from person to person and the disease dies out altogether. This is how smallpox was eliminated from the world and polio has disappeared from many countries.

DISEASES THAT CAN BE PREVENTED BY IMMUNISATION

Diphtheria, tetanus and whooping cough Diphtheria, tetanus, and whooping are serious disease that occurs in children and adults. Combination vaccines that include DPTa (diphtheria-tetanus-acellular pertussis) give effective protection against these diseases.

DIPHTHERIA

Bacteria found in the mouth, throat and nose of infected people cause this. It causes a membrane to grow around the throat, which can lead to difficulty in swallowing, breathlessness and suffocation. A powerful toxin is produced by the bacteria which can cause serious complications such as paralysis and heart failure. About 7% of people who contract diphtheria die from it.

TETANUS

Tetanus is an often-fatal disease caused by a toxin made by bacteria present in soil and manure. The bacteria enter the body through a wound, which may be as small and insignificant as a pinprick. Tetanus attacks the nervous system, causing severe muscle spasms, first felt in the neck and jaw muscles. The effects spread, causing breathing difficulties, painful convulsions and abnormal heart rhythms.

WHOOPING COUGH

This is also known as pertussis and is a highly contagious disease caused by bacteria and is spread by coughing or sneezing.

Whooping cough affects the air passages and can cause difficulty in breathing. Vomiting often follows the coughing spasm. The cough may last for months. Whooping cough is most serious in babies under 12 months of age, often requiring admission into hospital. Complications include convulsions, pneumonia, coma and inflammation of the brain, permanent brain damage and long-term lung damage. 1 in 200 children under six months of age who catch whooping cough die out of it.

POLIOMYELITIS

Poliomyelitis may cause mild symptoms or very severe illness. It is a gastrointestinal virus which causes fever, vomiting and muscle stiffness, and can affect the nerves and cause permanent crippling. Polio can paralyse the breathing and swallowing muscles, leading to death. About 5% of people hospitalized with polio die from it and about half of those who survive suffer permanent paralysis.

MEASLES, MUMPS AND RUBELLA

These are all serious viral diseases. A combined measles, mumps-rubella (MMR) vaccine is used to protect children against these diseases. Measles is a serious, highly contagious viral illness, which causes a fever, rash, runny nose, cough and conjunctivitis. Complications following measles can be very dangerous, and pneumonia occurs in 4% of cases. Mumps is a viral disease, which causes fever, headache and inflammation of the salivary glands. Occasionally it causes an infection of the membranes covering the brains (meningitis) but permanent effects are rare. Mumps can also cause permanent deafness. About 1 in 5 adolescents or adult males who contract the disease develops painful swelling of the testicles, while the person with this condition usually recovers completely, on rare occasions it may cause infertility. Rubella is also known as German measles and is a mild disease of childhood but can also affect teenagers and adults. The usual symptoms are slight fever, swollen glands, joint pain, and a rash, which appears on the face and neck and lasts for 2-3 days. The most dangerous form of rubella is congenital rubella, where infection occurs during the first 20 weeks of pregnancy and can result in devastating abnormalities in the newborn baby. Deafness, blindness, heart defects and mental retardation can occur. Rubella is highly contagious. The best way to protect expectant mothers and their babies from rubella is to make sure that all

women have been immunized before they become pregnant, and to immunize all children to stop the spread of infection.

H A E M O P H I L U S INFLUENZAE TYPE B (Hib)

Hib was the most frequent cause of life threatening infection in children less than five years of age before the introduction of Hib vaccines. It is not related in any way to influenza (the flu). It may cause infection of the membranes covering the brain, swelling of the throat, which can block breathing, pneumonia, joint infection, or infection of the tissue under the skin usually on the face.

HEPATITIS B

The first vaccine dose is given just after birth. Hepatitis B is a serious disease that can be contracted through out life. A virus that affects the liver causes it. Babies may have mild or no symptoms at all. Hepatitis B is present in infected body fluids including blood, saliva and semen. Babies whose mothers have hepatitis B are at very high risk of being infected at birth.

It is important to note that it is possible to get the disease even after vaccination, as there is no vaccine that is 100% effective. However if the disease does occur in an immunized child, the illness is usually much less severe than in those who are not immunized. There are very few medical reasons for delaying immunisation. If the child is sick and has a high temperature, then immunisation should be postponed until the child is recovering. Children who have had a serious allergic reaction, with breathing difficulty, to a previous dose of vaccine should not be given the same vaccine but a different type. Immunisation should be carefully considered for children with cancer, an immune deficiency disorder or who are on medications, which might interfere with their ability to fight infection. Children who have had a blood transfusion or immunoglobulin should not have their measles-mumps-rubella or oral polio vaccine until 3 months after the transfusion.

Many children experience minor side effects following immunisation. Most of these only last a short time and the child recovers without any problems. A child

needs comforting if side effects occur and you can reduce the side effects by following a few simple guidelines. Children normally have headaches, muscle pain; low-grade fever, soreness and redness at site of injection or at times joint pain. It is encouraged to give the child extra fluids after immunisation. Do not overdress the baby if he or she is feeling hot. Give paracetamol to lower fever and for pain if needed.

It is essential that you make sure that your child is immunized and follow the immunisation schedule to make sure the child is immunized at the correct age. Whilst it is good to get your child immunized, it is important to understand that immunisation of your child is not merely for their protection; it is also for the good of the community. There has to be a very high level of coverage of immunisation against a particular disease in a community to develop a broad defence against that disease. Immunisation is NOT just for your child, it's to protect all children! • ■

BREAST CANCER FACTS

One in eight women or 12.6% of all women will get breast cancer in her lifetime.

Breast cancer risk increases with age and every woman is at risk.

Every 13 minutes a woman dies of breast cancer.

Seventy-seven percent of women with breast cancer are over 50.

Early detection of breast cancer, through monthly breast self-exam and particularly yearly mammography after age 40, offers the best chance for survival.

Ninety-six percent of women who find and treat breast cancer early will be cancer-free after five years.

Over eighty percent of breast lumps are not cancerous, but benign such as fibrocystic breast disease.

Oral contraceptives may cause a slight increase in breast cancer risk; however 10 years after discontinuing use of oral contraceptives the risk is the same as for women who never used the pill.

You are never too young to develop breast cancer! Breast Self-Exam should begin by the age of twenty. 75% of all breast growths, whether malignant or benign, are discovered during self-breast examination

- The cause of breast cancer is unknown and it cannot be prevented.
- Family history of breast cancer significantly increases one's risk.
- 70% of women diagnosed with breast cancer have no known risk factors
- Nine out of ten growths are detected by women themselves

Cervical Dysplasia

Cervical Dysplasia (CD) is an abnormal benign or pre-malignant change that occurs in the cells of the female cervix. CD or cervical intraepithelial neoplasia (CIN) is asymptomatic. Left undiagnosed or untreated, CD can progress to cervical cancer (Clayman 1989). Worldwide, cervical cancer is still the second leading cause of cancer death in women (WHO 1997)

Women have the ability to prevent the progression of CD to cervical cancer through regular PAP SMEAR screening tests. However, according to the National Institute of Cancer (USA), in developing countries, very few women receive PAP tests and as a result invasive cancer affects an estimated 400 000 women each year, resulting in death of 250 000. The reason behind this is that some women decide not to have screening because they feel they are not at risk. Many other women are at higher risk as a result of lifestyle choices: smoking, use of oral contraceptives, multiple sex partners, stress and poor dietary habits. Women who have a weakened immune system, particularly those who are HIV positive or who are infected with the human papilloma virus (HPV) are particularly at risk.

HPV has been implicated as the primary cause of 90% of cervical cancers. Although mainly detected by PAP smear, lately HPV

genotyping of 37 different high risk and intermediate risk genotypes is now available (HPV linear assay). Detection of these risk HPV types can assist in earlier definitive therapy and management. This therefore means that even if a PAP smear is negative but HPV is still suspected a dry swab for genotyping can yield desired results.

There are three types of CD: Mild (CIN I), moderate (CIN II), and severe (CIN III). Mild dysplasia is by far the most common. It is not considered to be a true premalignant disease by many experts. However, mild dysplasia can represent a tissue response to the HPV virus. Up to 70% of the women who have mild dysplasia will have abnormal cervical cells return to normal cells over time without specific medical intervention. However, in some instances, mild dysplasia can progress to a more serious condition if it remains undetected. Moderate and severe dysplasias should be treated as soon as possible. Left untreated, these can lead to cervical cancer.

Routine screening with a regular PAP smear can detect cervical dysplasia. Early diagnosis and treatment can prevent it from progressing to moderate or severe dysplasias. Therefore, DO NOT skip your regular PAP screen because you consider yourself low risk. ■

By Cytology Department

WHAT A PHARMACIST CAN OFFER THE PUBLIC

Introduction

Pharmacists in Botswana can be found at hospitals, retail pharmacies, wholesalers, industrial and Ministry of Health Headquarters. The public can benefit a lot from all these different categories of pharmacists. Some have direct contact with the public while others have indirect contact. Most of this article will be based on the ones with direct contact with the public. Pharmacists' training has been evolving over the years, the reason for this being changing needs of the society. In the early years of the profession, compounding herbs for a specific disease was the main duty of the pharmacist. In the early days there was no synthetic medicine hence the use of herbs was a cornerstone of the profession. Nowadays most of the medicines are designed and produced in the laboratories. Therefore, pharmacists spend less time compounding medicines.

1. Retail/Community Pharmacists

Community pharmacists are easily accessible at the community pharmacy commonly known as 'chemist', as there is no need for prior appointment. Services that can be sought from community pharmacists are wide ranging. Management of minor illness can be done from pharmacies by pharmacists. This can save time and money. Pharmacists can assess the seriousness of the symptoms and refer to e.g. a medical doctor, dietician if necessary.

If a pharmacist thinks that the case she/he is faced with is a minor illness then he/she can make appropriate recommendations. The recommendations can be a medicine or just advice on how to manage the symptoms and signs. The medicines can be allopathic, herbal or homeopathic. This is one of the good skills that pharmacists possess, to understand the different types of medicines to meet the needs of the society. Minor illnesses include among others colds, coughs, heartburn, indigestion, vaginal thrush, cystitis, mouth ulcers, different types of headache, backache, eye infections, smoking cessation, constipation etc.

Counselling on management of chronic diseases like hypertension, diabetes, cancer, HIV/AIDS is a service that is also provided by community pharmacists.

Dispensing of medicines is also one of the duties of a community pharmacist. Pharmacists receive prescriptions written by medical doctors, dentists, ophthalmologists, prescribing nurses, veterinary surgeons. These prescriptions are then assessed for legality and clinical correctness. Medicines are then labelled and issued to the client.

The client is then informed on how to use the medicine, what side effects to expect and how to manage the side effects.

Pharmacists still mix different ingredients to produce medicines that are required for special cases, this is called extemporaneous preparation. Other activities that pharmacists assist clients on are pregnancy testing, blood pressure testing, blood sugar testing and measurement of weight and body fat.

2. Hospital Pharmacists

Hospital pharmacists are mainly involved in managing major illnesses. In hospitals compounding of medicines is still done at a scale larger than community pharmacies due to type of patients presenting at the hospital. This is due to the seriousness of diseases being treated at hospitals.

Dispensing of medicines (oral, injections, suppositories, pessaries, inhalers) and parenteral nutrition items is done by pharmacists. Usually the actual issuing of medicines is done by pharmacy technicians who are supervised by pharmacists. Pharmacists have to calculate the amount of medicine needed by a particular patient as prescribed by a medical doctor, especially for injections or medicines given via drip. This is to ensure that the right medicine of the correct strength, dose and formulation is given to patients.

Hospital pharmacists sometimes have to make certain medicines for injection in the hospital pharmacy. These medicines include antibiotics and cytotoxics (anticancer). In cases where a medicine is only available in tablet form and there is need for a solution (children or patient cannot swallow tablet) then a pharmacist has to mix the tablet with appropriate liquid.

In some hospitals pharmacist perform ward rounds alongside medical doctors to give them advice on the relevant medicines to be used. Reconstitution of disinfectants (chemicals used to kill germs) is done under supervision of pharmacists. These disinfectants come in very high concentrations and have to be diluted as required by a microbiologist. Microbiologists liaise with the pharmacists about germs that are available in the hospital and both come up with the right disinfectant and the right strength of that particular disinfectant. This is important because it helps reduce the germs in the hospital which can infect patients during their stay in a hospital.

Pharmacists are integral team members of a treatment guide team. Treatment guide includes a list of medicines which a particular team of healthcare professionals have agreed on for the use of managing different illnesses.

3. Wholesale Pharmacist

Wholesale pharmacists ensure that medicines are available at the right time to the retail pharmacies, hospital pharmacies and other dispensaries. They also ensure that medicines are kept under appropriate conditions whilst at the wholesale to prevent loss of potency and expiration.

4. Regulatory Pharmacist

Regulatory pharmacists ensure that medicines available in the country are of good quality, safe and efficacious. They do so by evaluating information submitted by manufacturers in a form of dossier. The evaluation is based on World Health Organisation (WHO) standards and other internationally recognised standards like the European Pharmacopoeia (EU), British Pharmacopoeia (BP), United States Pharmacopoeia (USP), International Pharmacopoeia (IP). Quality of the medicines is also assessed by performing inspection at the manufacturing sites. These inspections are based on WHO standards called current Good Manufacturing Standards.

5. Industrial Pharmacist

Industrial Pharmacists are responsible for producing efficacious and good quality medicines. They can be responsible for research and development, production or quality assurance.

Research and development pharmacists design the dosage form of medicines i.e. they choose the right inactive ingredients that will result in a good quality medicine. They come up with a recipe called a formula. These pharmacists then hand over to production pharmacists.

Production pharmacists make sure that medicines are produced according to stated formula and under the correct conditions. Quality assurance (QA) ensures that the personnel, environment, equipment are appropriate for manufacturing medicines and the formula was followed correctly. QA also has to check whether all the quality control tests were done and were within specified results.

Conclusion

All these different disciplines of pharmacy ensure that the patient, at the end of the days is given the correct medicine of good quality, in the right form, and which is effective to treat the particular condition. They also ensure that the medicines are used correctly. Pharmacy is a broad profession and some categories have not been mentioned in this article. They are correctly positioned and educated to advice on different medicines including herbal medicines. The next article will be covering herbal medicines in our community.

HEAVY METALS

Generally speaking, heavy metals are those metals, which do not support life and cause disease at relatively low levels in the blood stream. Poisoning due to heavy metals is uncommon but is very significant medically, if it does occur. If unrecognized or inappropriately treated, heavy metal poisoning can result high death rates. The most common heavy metals associated with heavy metal poisoning are lead, mercury, arsenic and cadmium.

The heavy metal lead is the most common poisonous metal and is also the most abundant contaminant of the environment and the body. It is the worst and most widespread pollutant. Lead is widely used as in paint. This is a problem with children, who are more sensitive to lead than adults because of their better absorption and smaller bodies. Lead is also found in petrol in the form of leaded petrol as an anti-knock agent. This has been the most widespread and persistent source of environmental contamination of leads to date. Other sources of contamination are:

- Food - especially that which is grown near industrial areas or roadways.
- Cosmetics- many pigments and other substances used for makeup and other cosmetics contain lead
- Water- drinking water carried in lead containing lead pipes.
- Cigarettes- lead is a contaminant in cigarettes as lead arsenate is used as an insecticide in tobacco growing.
- Pesticides- many pesticides and insecticides contain leads as lead arsenate.

Lead miners, insecticide makers, paint makers and battery makers are some of the most susceptible people to lead poisoning. Lead most likely interferes with the functions performed by essential minerals like calcium, iron copper and zinc, especially in brain chemistry. It is thus a neurotoxin and commonly generates abnormal brain and nerve function. Lead is also an immunosuppressant hence it lowers the host's resistance to bacteria and viruses and allows

increased infection rates. It passes into the brain and can also contaminate the in-utero foetus and breast milk. Most lead is stored in the bones, liver and soft tissue. Infants have little lead but the body concentration increases with age. Symptoms of lead poisoning include headaches, fatigue, muscle pains, anorexia, constipation, pallor and anaemia which are usually followed by agitation, irritability, restlessness, memory loss, poor coordination and hyperactivity. Acute lead poisoning is associated with abdominal pain, nausea and vomiting, muscle weakness, and encephalopathy. Lead encephalopathy is characterized by poor balance, confusion, lightheadedness, hallucinations, and speech and hearing problems. In children, hyperactivity and learning disorders including daydreaming, being easily frustrated, general hyperactivity, and excitability are the most common observed features.

Evaluating lead exposure and measuring lead levels is mainly done through blood and urine. Blood and urine lead levels diagnosis is made in association with symptoms. Results are interpreted as follows:

Lead Non-occupational exposure:
Adult: < 15 ug/dl child: < 10 ug/dl
COMMENT Under 40 Repeat
within 12mnths (male only) 40-59
Repeat within 6mnths (male only) 60-

79 Repeat within 3mnths (male only)
Over 80 REPEAT.

REMOVE FROM LEAD EXPOSURE NOTE: Females with blood levels > 40 should be removed from lead areas immediately.

Occupational exposure: Biological exposure index (B.E.I.) < 150 ug/g creat. In urine there is need to measure the creatinine value and calculate the lead creatinine ratio and the sample should be a 24 hour urine sample. A high urinary level suggests increased levels of body stores especially in the bones. A full blood count as well as a peripheral blood smear is also required. Finding usually include basophilic stripling of the red blood cells on smears. The anaemia of lead poisoning may be normocytic to microcytic. For chronic lead exposure analysis and follow up on treatment, hair analysis is also quite useful.

Mercury is a shiny liquid metal that is a widespread poisonous environmental contaminant. It is employed by medical and dental practices in thermometers, drugs dental amalgam for fillings, by agriculture in pesticides and fungicides and by the cosmetics industry. It is an industrial waste and contaminates water, fresh and salt water fish and plants. It finds its way into the human body via food, water, and air. It is poorly absorbed from the intestines, but whatever is inhaled finds its way into the



Sources of Toxic Metal Exposure

Mercury	Contaminated Fish (organic mercury) Mercury thermometers Thermostats Switches (mercury vapor) Coal burning power plants
Lead	Lead Paint Contaminated soil (particularly near highways) Contaminated industrial sites
Arsenic	Shellfish (non-toxic) Certain insecticides Well water in contaminated regions
Cadmium	Cigarette smoke Metal production Poor industrial hygiene

blood as mercury is soluble and passes through the lungs. Sources of mercury are mainly fungicides, cosmetics, dental fillings, coal burning and fish. Anyone working with mercury is susceptible to this type of poisoning, especially dentists, mirror makers, insecticide makers and paper makers.

It is retained mostly in the kidneys and can get in the brain hence the central nervous system symptoms. It can also get to the foetus and also pass to the baby via breast milk. It is eliminated daily via urine and faeces. Symptoms mostly include fever chills, coughing and chest pains followed by fatigue, headache, insomnia, impaired judgement and loss of sex drive. Hair tissue analysis is the best method of analysis to measure body stores while urine will show whether the body is actively working to remove it. A 24-hour urine sample is required for urine analysis and a whole blood sample is required for measuring mercury short chain alkyls.

INORGANIC MERCURY - REFERENCE LIMITS: Industrially nonexposed: < 10 ug/L BIOLOGICAL MONITORING: Biological exposure index (BEI): 15 ug/L (inorganic mercury): 0.025 mg/m³ . Blood specimens are preferred for exposure to methyl mercury (organic phase) and for acute exposure.

ORGANIC MERCURY - REFERENCE LIMITS: Industrial nonexposed: < 50 ug/L BIOLOGICAL MONITORING: Tentative maximum permissible concentration: 100 ug/L TLV (Threshold limit value) - (as Alkyl mercury): 0.01 mg/m³ In case of exposure, repeat mercury levels every

3 months

BEI in industrial exposure: 35-ug/g creat in urine.

Arsenic can accumulate when kidney function is decreased. Absorption is low i.e. less than 5% of ingested. And most of it is eliminated in faeces. Arsenic trioxide is used industrially and is the most poisonous of the arsenics. Its toxicity is shown by hair loss, dermatitis, diarrhoea, and other gastrointestinal symptoms. Arsine gas exposure is very toxic to the lungs and kidneys and is often fatal. Exposure to insecticides, weed killers, contaminated meats and fumes from the burning of arsenic containing coals and oils may cause toxicity. Miners, smelters and vineyard workers have a higher risk of arsenic trioxide exposure and also a higher incidence of lung cancer. Complications associated with this are largely neurological.

Cadmium has become a more prevalent cause for concern in recent years. Like lead, it is an underground mineral that did not enter our air, food, and water in significant amounts until it was mined as part of zinc deposits. Now there is widespread environmental contamination with cadmium.

Cadmium displaces zinc in some of its important enzymatic and organ functions. Good levels of zinc protect against tissue damage by cadmium. The refinement of grains reduces the zinc-cadmium ratio, so zinc deficiency and cadmium toxicity are more likely when the diet is high in refined grains and flours.

No cadmium is present in newborns, cadmium does not cross the placenta-fetal barrier nor the blood-brain barrier as lead and mercury do, so it is not toxic to fetuses, nor does it cause the mental and brain symptoms of lead and mercury..

Cadmium is not very well absorbed, with

a rate of about 20 percent, but this is still a higher rate than that of many other minerals. It is excreted mainly by the kidneys. It is stored primarily in the liver and kidneys.

There are many sources from which our environment and our bodies can be contaminated with cadmium. Cigarette smoke, refined foods, water pipes, coffee and tea, coal burning, and shellfish are all definite sources. Cadmium is also a component of alloys, used in electrical materials, and is present in ceramics, dental materials, and storage batteries. Smoking marijuana may also concentrate cadmium, so regular smoking of cannabis may also be a risk factor for toxicity from this metal. Water pipes can be a source of cadmium concentration. Cadmium is often used to protect metals from corrosion. Galvanized (zinc) pipes usually contain some cadmium, as does the solder used to hold them together. Soft or acid water is corrosive and causes the metals in the pipes to break down, releasing cadmium and other minerals from them. Hard water containing calcium and magnesium salts actually coats the pipes and protects against the leaching of other minerals. Air pollution of cadmium comes from zinc mining and refining, and from the burning of coal. Cadmium is also an industrial contaminant from the steel-making process.

Cadmium concentrates in the kidney and can generate kidney tissue damage and hypertension, as well as an increased incidence of calcium kidney stones. Cadmium appears to depress some immune functions, mainly by reducing host resistance to bacteria and viruses. It may also increase cancer risk, possibly for the lungs and prostate. Cadmium toxicity has been implicated in generating prostate enlargement, possibly by interfering with zinc support.

Industrial workers, metal workers, zinc miners, and anyone who works with zinc galvanization may accumulate more cadmium. Those who drink soft water; those who smoke or whose friends, roommates, or coworkers smoke; coffee and tea drinkers; and those who eat refined flours, sugars, and white rice are also likely to receive greater exposure to cadmium. ■

Signs of Labor:

- Painful cramps getting progressively worse and more often.
- Passing a lightly bloody mucus plug.
- Feeling a gush of amniotic fluid - the supportive fluid which surrounds your baby.
- Pressure in your bottom which makes you feel like pushing.

If you experience these signs your baby is on the way and you should be on the way to your hospital labor suite. Best Wishes :)

Pregnancy - Screening Tests

What are screening tests?

A screening test aims to detect a disease or condition in the early stages before it causes significant problems, and where treatment can be offered. The potential benefits of a screening test should outweigh any possible risks from the test.

Most pregnant women have normal test results. A small number of tests are abnormal. In these cases further assessment and/or treatment can be offered which may prevent serious problems.

Various other tests may also be offered in certain circumstances during pregnancy. For example, if you have symptoms which suggest a complication then other tests may be relevant.

General history

Strictly speaking, this is not a 'test'. However, it can raise issues which may need special attention during the pregnancy which may prevent problems later in the pregnancy.

For example, if you have diabetes, or if you had pre-eclampsia in a previous pregnancy, you will need closer monitoring than usual during the pregnancy. If you have social or family problems such as domestic violence then you may need special help.

Routine physical examinations

- **Weight and height.** Early on in the pregnancy your doctor or midwife will check your weight and height. This is to see if you are significantly underweight or overweight which may increase the risk of developing problems during pregnancy.
- **Assessing the growth of the baby.** This is done by a midwife or doctor during routine antenatal checks. They use a tape to measure from the top of the growing uterus (womb) to the pubic bone (the bone at the bottom of your abdomen).
- **Blood pressure.** This is measured regularly during routine antenatal checks. Together with a urine test which detects for protein, this screens for a complication of pregnancy called pre-eclampsia
- **Examination of the baby's position.** About 36 weeks of pregnancy a doctor or midwife will examine your abdomen to feel the baby to detect if the baby is lying breech (bottom down). If so, treatment to turn the baby to a head down position may be considered.

If you are otherwise healthy, other physical examinations are not routinely

done

Routine urine tests

Urine is checked at antenatal checks using a simple dipstick test to detect:

- **Protein.** Protein in the urine may indicate early pre-eclampsia.
- **Bacteria.** During pregnancy you can have an infection of the urine without symptoms ('asymptomatic bacteruria'). This can increase the risk of problems later in pregnancy such as early childbirth. It can be treated with antibiotics.

Routine blood tests

A sample of blood is taken early on in pregnancy and these are sent to the lab to check for:

- **Anaemia.** The common reason for anaemia is lack of iron which can usually be treated easily with iron tablets.
- **Blood group including rhesus D status and red cell antibodies.** If you are rhesus D negative and your baby is rhesus positive then you may form anti-D antibodies in your bloodstream. These are not dangerous in the first pregnancy, but can attack the blood cells of a baby who is rhesus D positive in any future pregnancy.
- **Rubella status.** This test checks for antibodies to the rubella virus (german measles). If antibodies are present it means that you are immune to this infection. If you are not immune, when you are pregnant you should keep away from anyone who may have rubella. Also, consider being immunised against rubella after giving birth to protect future pregnancies. If a pregnant mother develops rubella it can seriously damage the unborn baby. Ideally, your rubella status should be checked before becoming pregnant so that, if necessary, you can be immunised before becoming pregnant.
- **Certain infections.** Some uncommon but serious infections are checked for. These are:
 - **HIV.** This is the virus that causes AIDS. You can be infected with HIV for years before it causes symptoms. The risk of passing this virus on to your baby can be greatly reduced with treatment during pregnancy, and delivery by caesarean section.

- **Hepatitis B.** Many people are carriers of this virus but have no symptoms. In some cases it can cause serious liver damage. If you have this virus, it may be prevented from affecting your baby if the baby is immunised at birth.
- **Syphilis.** You can be infected with this bacteria without realising and pass it on to your baby. It can develop into a serious illness. It can be treated with antibiotics.

A repeat blood test at about 28 weeks is usually offered to re-check for anaemia and red cell antibodies.

Routine ultrasound scans

An ultrasound scan is a safe and painless test which uses sound waves to create images of structures inside your body such as an unborn baby. A routine ultrasound scan is usually offered at:

- 10-13 weeks of pregnancy to accurately date the age of the unborn baby and expected time of birth, and to check for twins (or more), and at:
- 18-20 weeks of pregnancy to look for physical abnormalities of the unborn baby.

Screening for Down's syndrome

Down's syndrome is a condition which is caused by an abnormal chromosome. Children with Down's syndrome have learning disability and often have other medical problems. There are different screening tests for Down's syndrome and so different tests may be used in different areas. They include a blood test and a special ultrasound test, or both. Screening for Down's syndrome is offered sometime between 11 and 20 weeks of pregnancy, depending on the type of test used.

Note: the screening test is not a clear-cut diagnostic test. Therefore:

- A 'positive' test means that you *may* have a child with Down's syndrome. If you have a positive screening test, further tests are needed to confirm the diagnosis. In some positive tests the baby does not have Down's syndrome (a 'false positive' result).
- A negative test does not completely rule out Down's syndrome. (That is, in some cases there is a 'false negative' result.) ■

POSTPARTUM DEPRESSION

Depression is generally defined as a mood disorder in which the feelings of sadness, loss, anger, or frustration interfere with everyday life for an extended period of time. Depression occurring during pregnancy or within a year after delivery is called perinatal depression. During pregnancy the following may increase a woman's chance of depression:

- a- History of depression or substance abuse
- b- Family history of mental illness
- c- Little support from family and friends
- d- Anxiety about the foetus
- e- Problems with previous pregnancy or birth
- f- Mental or financial problems
- g- Young age of mother

After pregnancy the condition is called post partum depression. Postpartum depression is a complex mix of physical, emotional and behavioural changes that occur after giving birth that are attributed to the chemical, social and psychological changes associated with having a baby. There are four separate important problems.

- 1- **Postnatal blues** – this happens within 24 hours after birth and normally goes away within a few days. Clinical features include feeling flat, mood swings, irritability, feeling emotional, tiredness, sleeping problems, lack of confidence and headaches. Symptoms are not severe and no treatment is required. Reassurance and home support are normally sufficient to help.
- 2- **Postnatal adjustment disorder** - this occurs within the first 6 months and symptoms are similar to those of the blues although they persist for a longer period. Other symptoms include fear of critics on handling the child, psychosomatic complaining and anxiety with handling the baby. Normally the mother settles with time and no major treatment is required.
- 3- **Postpartum depression** – can occur at anytime within the first year after childbirth. Anxiety and agitation are common. Marked mood swings, poor memory and lack of concentration are common. The mother feels overwhelmed with the baby and cries a lot, and also feels a lot of stress from changes at work and at home. The mother will also lack energy and motivation and feel worthless and guilty. They withdraw

from friends and family and have fear of hurting herself or the baby and sometimes lack interest in the baby. Postpartum depression affects a woman's well being and keeps her from functioning well for longer periods of time. It needs treatment from a doctor, counseling support groups and medication. Hospitalization may be necessary if the mother is suicidal or infanticidal.

- 4- **Postpartum psychosis** – This is an extremely severe form of postpartum depression and requires emergency medical attention. This condition is relatively rare, affecting women after delivery. The symptoms generally occur quickly after delivery and are severe, lasting for a few weeks to several months. Symptoms include severe agitation, confusion, feelings of hopelessness and shame, insomnia, paranoia, delusions or hallucinations, hyperactivity, rapid speech, or mania. Postpartum psychosis requires immediate medical attention since there is an increased risk of suicide and risk of harm to the baby. Treatment will usually include admission to hospital for the mother, and medicine.

Helpful hints:

1. To get as much rest as you can. Sleep when the baby sleeps.
2. Stop putting pressure on yourself to do everything, do as much as you can and leave the rest.
3. Ask for help to do house work and looking after the baby.
4. Do not spend a lot of time alone.
5. Spend more time with your husband or partner.
6. Talk with other women so you can learn from their experiences.

All babies deserve the chance to have a healthy mother and all mothers deserve a chance to enjoy their lives and their babies. Do not go through problems alone. If you are experiencing symptoms of depression during pregnancy or after having a baby, talk to your partner or family members and seek medical attention if necessary. ■

By Bozo

LACTOSE INTOLERANCE

Introduction:

"John loves me very much and shows that by buying me chocolate cakes;but each he does that I get sick; I wonder why" said Susan to her friend; Catherine.

"May be this could be due lactose intolerance" answered Catherine.

What is lactase intolerance? It is a disorder resulting from shortage of an enzyme lactase necessary for breakdown of lactose to simple sugars glucose and galactose.

What are foods/drinks that contain lactose?

- A. dairy products such as milk;cheese and ice cream.
- B. Drugs-some birth control pills and tablets for stomach acid and gas
- C. Other foods-label of ingredients indicates if they contain lactose. Example of these foods include; margarine; biscuits; candies; cereals; breakfast drinks; hot chocolate mixes artificial sweeteners etc.

What are the symptoms ?

½ an hour to 2 hours after taking or drinking anything containing lactose one develops the following symptoms.They vary from mild to moderate.

- A.stomach cramps
- B. bloating
- C.gas
- D.diarrhea
- E.nausea

Diagnosis.

There are 3 methods.

- A. Stool acid test-in this test we determine presence of reducing substances ie sugars in stool specimens.
- B. Hydrogen breath test-in this test the patient has to fast overnight and at regular intervals after taking a dose of lactose the amount of gas is measured.If lactose is not digested you produce hydrogen.
- C. Lactose tolerance test-this is a blood test where glucose is measured before and after the patient drinks large amount of liquid containing lactose.The patient is required to fast before the test is done.

Treatment of symptoms

- A. There are supplements that can be taken before taking anything containing lactose
- B. Lactose reduced products
- C. The easiest inexpensive way is to avoid foods containing lactose ■