



AOGD



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**CARING FOR WOMEN'S HEALTH :
EVIDENCE, ATTITUDE & PRACTICE**

Dedicated Issue:
**Clinical Dilemmas & Unresolved issues in
Gynaecology & COVID -19 Pandemic – Further issues**



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From the President's Pen



I hope this edition finds you all in the pink of health and heights of spirit. The corona crisis continues and is challenging the entire mankind. We have to brave this corona challenges and emerge as an inevitable winner.

This new virus is causing newer disease. It has a nature of mutating frequently and so our protocols are also changing rapidly. In this edition we have collection of articles which caters to our changing protocols and emerging guidelines.

Our esteemed editors Dr. Geeta Mediratta and Dr. Chandra Mansukhani has worked tirelessly and brought out an excellent collection. I am sure our members will benefit immensely.

The article on “Enhanced Recovery After Surgery (ERAS)” refers to development of patient-centered, evidence-based, multidisciplinary team pathways for a surgical specialty and facility culture to reduce the patient’s surgical stress response, optimize their physiologic function, and facilitate recovery.

There are tips for the tackling of “Acute Postoperative Pain Management”. The comment on the “Lymphadenectomy in Management of Gynaecological Cancers” has given light on the surgical aspects of patient management. The various organizations are facing problems at ground level to tackle the COVID crisis. These difficulties in day to day practice have been wisely compiled and addressed. During COVID times contraception is a tricky issue which has been intelligently briefed. There is also description of Scope of Robotics Surgeries during COVID era. There is elaboration on the masks as the most important aspect of Personal Protective Equipment. I am sure this bouquet of knowledge will meet the inquisitiveness of all our members.

The academic activities continue through virtual platform. We are taking adequate enthusiasm in performing various webinars on different and varied topics.

We strive to provide such elaborate collection of academic modules also in the future. Be careful and stay safe while performing duties and day to day activities. With this note I wish all the best to our members.

Long live AOGD!

Dr Mala Srivastava
President, AOGD

From the Vice President's Pen



Greetings to all members of The Association!

Last week as I sat to write my wish list on **World Environment Day**, I wondered if it's appropriate to be asking for **blue skies and nature rebounding** when the world is in the midst of a global health crisis, thousands of people have lost their lives, hundreds have lost their jobs, thousands of migrant workers are on a long walk home on foot, we faced environmental hazards like Cyclones & earthquakes, threats from swarms of locust, lost several lives due to gas leakages and recently an elephant succumbing to the injuries reportedly 'fed with a fruit laced with firecrackers'. I know the **world and our country is facing a crisis of seismic proportions**.

But all this has not deterred our medical fraternity, rescue and relief agencies to perform their duties in the midst of a lockdown, containment zones and social distancing norms. I would like to sincerely thank all of them for their selfless efforts to fight these tough times, despite restrictions being imposed upon them from various fronts.

We at AOGD tried our best to ensure that we fulfil our objectives to provide a platform for increasing knowledge, skills and awareness to our members in advances in the field of Obstetrics & Gynaecology using alternate channels like virtual meetings and webinars on thought provoking topics with experts from all over the country and sometimes International too.

Our **first monthly AOGD virtual meeting** was very well attended and well received, thanks to the excellent efforts from Dr B L Kapoor Hospital team lead by Dr Dinesh Kansal.

It gives me great pleasure to share that our editorial team lead by Dr Geeta Mendiratta and Dr Chandra Mansukhani along with Dr Ruma, Dr Sharmistha, Dr Sakshi and Dr Ila have beautifully wrapped up the entire months events and write ups from experts into this bulletin. I hope our endeavours meet your expectations of the academic feast you are looking up to.

And now as we rush to support our **Nation's unlock phases**, we will continue to contribute through guidelines to advise and help our people to stay **safe and healthy**.

With Warm Regards,

Dr Kanika Jain
Vice President AOGD (2020-21)

From the Secretary's Desk



Greetings to all !

As the past few months have really strengthened the links between AOGD and its members, it seems certainly a closer collaboration that we would like to continue to foster through the Pandemic and beyond.

Our editorial team has brought the next version of E-Bulletin on **CLINICAL DILEMMAS & UNRESOLVED ISSUES IN GYNAECOLOGY & COVID-19 PANDEMIC** including information from esteemed authors, for which we are incredibly grateful. The upcoming issue covers more information on several areas which our members should find useful and serve as a basis for adaptation for your local context.

As part of AOGD, we are keen to adapt examples of innovative practices in the coming times, so that we can be in better position to implement newer ways of working. As there are likely to be restrictions in place for the foreseeable future, we are prioritising digitalized information and request all the members to view the AOGD website for the upcoming activities.

Looking forward to your continued support.

It is our attitude at the beginning of a difficult task which, more than anything else, will affect its successful outcome. – William James

Warm Regards

Dr Mamta Dagar

Hon. Secretary

Monthly Clinical Meeting

AOGD Monthly Virtual Clinical Meet & GBM will be organised by Safdarjung Hospital, New Delhi on **Friday, 26th June, 2020 from 04:00pm to 06:00pm.**

From the Editor's Desk



Dr Geeta Mediratta

We begin this bulletin with articles dealing with current clinical dilemmas and certain unresolved issues like Enhanced Recovery After Surgery (ERAS), Acute Postoperative Pain Management and Lymphadenectomy in Management of Gynaecological Cancers.

As our understanding of the novel coronavirus and the challenges it presents evolves and improves a little with every passing day, we at AOGD have decided to dedicate the second part of the bulletin to COVID-19 Pandemic - Further Issues.

There were major organisational challenges and clinical challenges faced during the lockdown by The Obstetrics and Gynaecology departments nationwide in the setting of the pandemic with regards to setting-up these facilities and managing pregnancy cases. Major structural and administrative changes had to be made. These are addressed in this issue.

However, as the nation prepares for Unlock 1.0, and the Indian people prepare to return to their normal routines while practising social distancing, we must broaden our scope of understanding of the disease and explore further challenges faced because of COVID-19 in other areas of our specialty such as in Contraception and Robotic Surgery as well.

As we gear up for the rising case load that opening up the lockdown is sure to bring, and in the face of community spread of the disease in most urban areas of India, perhaps more important than ever is the need for proper understanding and use of Personal Protective Equipment. Thus, in this bulletin, as well in upcoming bulletins, we will address the issue in detail.

While it is easy to feel overwhelmed by the complex and distressing challenges created by this pandemic, it is important to remember to be strong and to not lose hope. We, the doctors of the nation, are it's frontline defence against COVID-19, and in order to conduct ourselves as such, we must first learn to defend ourselves against this faceless enemy and to maintain our mental peace no matter what. Gurudev Sri Sri Ravi Shankar guide us on this aspect.

Let us pledge to be strong, and to rise to this challenge, and to any others, with grace and aplomb!

We welcome any suggestions from our esteemed members.

Happy reading!

Editorial Team

Part - 1

Enhanced Recovery After Surgery (ERAS)

Geeta Mediratta

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What is ERAS?

Enhanced recovery after surgery pathways were first of all developed by colorectal surgeons. As time passed, it was shown that a standardised pre and post-operative protocol based on evidence based literature reduces: - Hospital stay, cost, opioid requirement, post operative complications. It also accelerates the return to normal function. (Ref: 1,2)

THE 3 MAIN ELEMENTS/ COMPONENTS OF ERAS ARE :-

1. Optimising Nutrition Before and After Surgery (As Nutritional Status Directly Impacts Healing Process).
2. Opioid Sparing Analgesia.
3. Maintenance of Euvolemia Before, During and After Surgery.

PRE-OPERATIVE COUNSELLING AND PRE HABILITATION

KEY COMPONENTS IN ALL ERAS PATHWAYS.

- a. Pre-operative education /counselling.
 - b. Active engagement of patients.
 - c. Post-operative recovery.
- } These lead to decreased anxiety and shortens hospital stay.

CONCEPT OF PREHABILITATION:-

Process of enhancing functional capacity of the individual to enable them to withstand incoming stressors.

This consists of :-

1. Improving physiological reserve.
2. Aerobic conditioning
3. Resistance training
4. Optimising nutrition (to balance the catabolic response after surgery)
5. Minimise the emotional burden of surgery.

1. NUTRITIONAL OPTIMIZATION

The American society for Anaesthesiologists supports. (Ref: 3)

- Reduced fasting
- Solids until up to 6 hours pre op
- Clear liquids up to 2 hours pre op
- Early resumption of feeding i.e. 4hrs after surgery.

ADVANTAGES:-

- Lower volume of gastric contents and thus less aspiration.
- Carbohydrate loading decreases peri operative catabolism and insulin resistance triggered by surgical stress.
- Decrease in protein breakdown
- Increased tissue healing
- Diabetic patients also benefit
- Early feeding post operatively leads to earlier return of bowel function
- Shorter hospital stay
- Lower infection mobility.

2. PERI OPERATIVE MULTIMODAL ANALGESIA (TO MINIMISE OPIOID USE) (DEALT IN DETAIL IN NEXT ARTICLE)

Perioperative opioids are associated with a number of adverse side effects including depression of respiratory drive with subsequent pulmonary morbidity, altered mental status and delirium, postoperative nausea and / or vomiting with delayed return of bowel function, delayed mobilization, and new, persistent opioid use.

Components:-

1. Pre-operative analgesia, i.e. blocking the pain receptors before being stimulated by noxious stimuli.
2. Use of non-opioid alternatives have less side effects of n/v.
3. Agents used:- oral acetaminophen, celecoxib, gabapentin (Ref. 4)
4. Glucocorticoids can also be used. A randomised trial of patient undergoing lap Hysterectomy

(excluding diabetes) showed that opioids dose were most effectively reduced after first 24hrs of surgery with 15mg of I.V. dexamethasone compared with 5mg or 10mg dose.(Ref.5)

Post operative pain management (Refer to the article on “ Acute post operative pain management” for details)

1. Multimodal oral analgesia.
2. Acetaminophen + NSAIDS on a scheduled based. (unless there are specific contraindications).

REGIONAL Analgesia

Advantages:-

- Minimises opioid use
- Eliminates PCA use
- Decreases hospital stay
- Optimum pain control

OPTIONS:

TAP block:- Infiltration of LA in plane between internal oblique and transversus abdominis plane block under USG guidance. (TAP)

- Thoracicepidural analgesia
- Continuous wound infiltration
- Intraperitoneal local anaesthesia in gynaecological surgery.
- Liposomal bupivacaine for incisional injection. (Gradually releases medication for 72-96 hours) This significantly reduces opioid requirements and PCA use post operatively.

SPECIAL CONSIDERATIONS IN VAGINAL SURGERY.

Regional analgesia with intrathecal morphine or paracervical block after vaginal hysterectomy as associated with decreased post operative pain and early mobilisation.

SPECIAL CONSIDERATION IN MINIMALLY INVASIVE SURGERY

- Multimodal pharmacologic analgesia is best.
- Wound infiltration not much benefited with TAP or thoracic epidural analgesia.

3. EUVOLEMIA

Liberal Perioperative fluids administration has been questioned currently due to risks of hypervolemia like increased cardiac and renal demands and

tissue edema, Ileus, sepsis, poor wound healing. Thus, regimens which aim to achieve euvolemia or **NEAR – ZERO FLUID BALANCE** have been shown to be better tolerated with lesser sequelae, lesser renal morbidity.

It is important to note that euvolemia is established pre operatively i.e. patient be allowed clear liquid until 2 hour before induction of anaesthesia I/V fluid @ 0.8 – 1.2 ml / kg/ hr to be given there after.

- Urine output in post operative setting can drop to 20 ml/ hr and indicates normal response to surgical stress.
- To use balanced crystalloid solution rather than 0.9% normal saline to avoid hyper chloremic acidosis.

BOWEL PREPARATION

Quality data from RCT's has proven that mechanical bowel preparation preoperatively when compared to no mechanical bowel preparation was not associated with decreased surgical site infections, anastomotic leaks, reoperative rates or overall mortality in patient undergoing colorectal surgery.

The second issue of oral antibiotics as preoperative bowel preparation, RCT's have reported superiority of combination of oral antibiotics in decreasing post operative infections in colorectal surgery.

So ERAS society guidelines indicates that bowel preparation should not be used before minimally invasive gynaecological surgery. As far as mechanical bowel preparation is concerned, there is no data to suggest any benefits. However, in case the health care provider strongly desire to use bowel preparation this should be limited to patients with planned bowel surgeries and should consist of oral antibiotics alone.

CONCLUDING REMARKS (TAKE HOME MESSAGE)

- ERAS pathways provides benefits for both minor / minimally invasive surgery and complex/ invasive procedure.
- Three important concepts of ERAS pathways include
 1. Optimal nutrition
 2. Opioid sparing analgesia
 3. Euvolemia
- These concepts can be achieved if we emphasize on use of non opioid, oral analgesics, use of wound

infiltration with local analgesics, discontinue use of bowel preparation for patients undergoing benign or minimally invasive. Avoid “NPO after midnight” to maintain energy stores throughout the pre operative period to optimise healing

- Certain measures like patient education and optimising medical co morbidities should be included in ERAS pathways.
- Surgical teams should continuously monitor the outcomes to ensure compliance. Auditing should be performed regularly with recommended preoperative intervention and improving outcomes after implementation.
- The most important point to remember is that ERAS pathways should be patient centric i.e. recovery to normal improved function rather than health provider centric i.e. time to extubation, PACU length of stay.

AREAS OF FURTHER RESEARCH

Identification of least expensive and most effective means of carbohydrate loading, the timing duration and benefits of prehabilitation and specific recommendations i.e. choice of drugs, timings & dose of pre-emptive medications which reduces opioid requirement nausea/vomiting inflammation attenuates other physiologic derangement caused by surgical stress.

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Acute Postoperative Pain Management

Anjeleena Kumar Gupta

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Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.¹ It is a symptom, informing the organism about the tissue injury in order to prevent further damage and may last several hours to days or even months.

To be pain free is now considered a basic human right. In the year 1995, pain was designated as the 'fifth vital sign' by the Joint Commission on Accreditation of Healthcare Organisations.²

Acute postoperative pain is iatrogenic in nature caused by the surgical intervention. It affects every organ system. Psychological effects of pain are dependent on many factors including patient's expectations, individual tolerance, sense of self determination, previous exposure, gender, age, cultural beliefs and many more.

Pain has negative impact on all organ systems: gastrointestinal, respiratory, and central nervous, cardiovascular, renal and endocrine. There is an increase in the length of hospital stay, which adds to the economic burden and impairs the quality of life. Pain adds to significant morbidity and mortality. In obstetrics, the effects of pain are seen not only on the mother but also the new born. Untreated postoperative pain (post caesarean section) has a 6-55% incidence of developing into chronic pain.³

Despite the knowledge of the ill-effects, the pain is ineffectively controlled in nearly 50 % of the surgical patients. Adequate control of pain and providing comfort to the patient would promote rapid mobilization, early resumption of normal activity, better patient satisfaction, reduce complication rates, early discharge from hospital and faster turnover of patients in the hospital.

Pain control by epidural and spinal analgesia has shown reduced perioperative complications viz intraoperative blood loss (30%), tachycardia (78%) myocardial infarction (70%), pulmonary complication (40%), thromboembolic complications (50%) and mortality (25%).^{4,5}

Pathophysiology of Pain

Pain is a complex physiological process with mechanical, neurological, hormonal and psychological limbs. Postoperative pain is mostly nociceptive in nature. Surgical stimulus results in the release of multiple inflammatory mediators such as prostaglandins, leukotrienes, 5-hydroxytryptamine (5HT), adenosine triphosphate (ATP) and bradykinin which are sensed by the nociceptor prostanoid receptors present at the nerve endings of primary afferent A delta and C fibers. The depolarized nerves then transmit pain signals to be dorsal horn of the spinal cord and synapse with the second order neurons which in turn cross to the opposite side and ascend through the anterolateral spinothalamic tracts to reach the thalamus and synapse with the third order neurons present in the cerebral cortex where the sensation is perceived as pain.

Predictors of Postoperative Pain

Postoperative pain is dependent on a number of patient and surgical factors [Table 1].

Apart from the above factors even *hypervigilance* i.e. strong attention bias towards pain has proved to be a predictor of postoperative pain.

Table 1: Factors affecting post operative pain

Patients factors	Surgical factors
<ul style="list-style-type: none"> • Young age • Anxiety • Obesity • Preoperative pain • Fear of surgery 	<ul style="list-style-type: none"> • Site of surgery • Surgical approach (open vs. minimally invasive) • Duration of surgery • Surgical experience

Multimodal Analgesia

Multimodal analgesia is the cornerstone of pain management. The concept of multimodal analgesia was introduced by Henrik Kehlet in 1993 to modulate the perioperative stress response by regional anaesthetic techniques and utilise the 'opioid sparing' effects of adjuvants to minimise the side effects of opioids. As the name implies, multimodal analgesia entails providing analgesia

Figure 1: Postoperative analgesic ladder

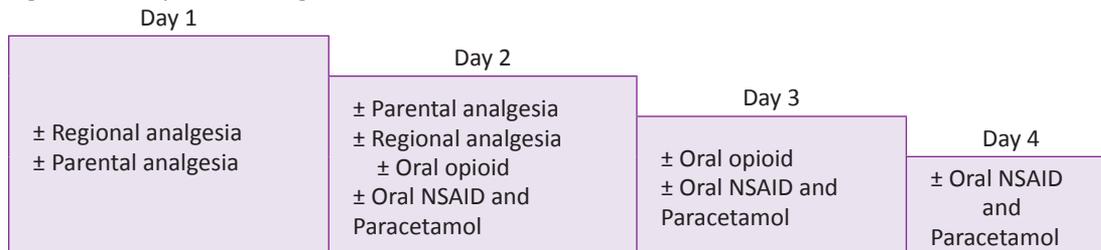


Table 2: Analgesic drugs and their mechanism of action

Drug category	Example	Dose	Mechanism of action
Nonsteroidal anti-inflammatory drugs (NSAIDs)	Diclofenac	75 mg BD	Inhibits COX 1 and COX 2
	Ibuprofen	200-400 mg QID (oral) 400-800 mg QID (IV)	
Selective inhibitor COX 2	Etoricoxib	90-120 mg OD	Inhibits COX 2
	Celecoxib	200 mg BD	
Acetaminophen	Paracetamol	500-1000 mg QID, max 4g/day (adults)	Inhibits COX 3 peripherally ± centrally
Local anaesthetics	Lidocaine	4-7 mg/kg	Inhibits sodium channel for nerve conduction
	Bupivacaine	2 mg/kg	
	Ropivacaine	2 mg/kg	
	Levobupivacaine	2.5 mg/kg	
Opioids	Fentanyl	1-3 mcg/kg (IV)	Mu, kappa, delta receptors
	Morphine	10-20 mg (oral) 100 mcg/kg(IV) 50 mcg/kg (epidural) 100-200 mcg (spinal)	
Gabapentanoids	Pregabalin	75-300 mg BD	Inhibits alpha 2 delta and calcium channel receptors
	Gabapentin	300-1200 mg TDS	

through various modalities each acting on a different site on the pain pathway from the periphery to the brain. The various drugs used for analgesia are enumerated in table 2. The postoperative analgesic step ladder provides a framework to provide analgesia (fig 1).

Assessment of Pain

Standardized pain scale to guide therapy is a neglected tool. Various scales have been described for this purpose [Numerical rating score (NRS), Visual analogue score (VAS) and Smile-o-meter]. However, it is difficult to judge patients requirements for and response to analgesia. It is important that a regular periodic assessment of rest pain, dynamic pain (on movement, coughing, breathing etc) and functional status of the patient is done.

Treating rest pain adds to the patient’s comfort while control of dynamic pain decreases the cardiopulmonary and thromboembolic

complications thereby, improving the immediate and long term outcomes post surgery. Stronger analgesics are needed to control dynamic pain. Parenteral analgesics alone are insufficient to achieve it in the first two days post surgery. Hence, regional blocks are advocated along with them.

Preventive Analgesia

The concept of preventive analgesia is a pharmacological strategy based on the administration of analgesic treatment before the surgical stimulus is induced in order to prevent postoperative pain.^{6,7} Not only the surgical incision but also the retraction, post operative inflammatory processes, related peripheral and central neuro-modulators and ectopic neural activity causes central sensitisation.⁸ Recent studies have shown that it is more effective to start postoperative pain treatment before surgery.⁶ An effective analgesia ensured in the postoperative period will not only

reduce complications but also bring along a fast recovery.⁶

Its use has proven benefits of reduced opiate usage perioperatively. Pre or post surgical infiltration of local anaesthetics has shown equivocal effects on analgesia. Acetaminophen ± NSAIDS + pregabalin has been proposed to be an effective regimen if given perioperatively although, the evidence for the timing of drug administration is not very strong.

Procedure Specific Postoperative Pain Management

Gynaecological Abdominal Surgery

Postoperative pain management is an essential part of Enhanced Recovery program (ERP). Following abdominal surgery, postoperative pain can be immense and debilitating. Inadequately controlled pain can lead to dissatisfaction, post-operative complications and eventually result in chronic pain. Aim is to effectively control pain and satisfy other targets of ERP as early mobilisation, return to oral diet. Thoracic epidural analgesia (TEA) has gained widespread acceptance for postoperative analgesia in the past for open abdominal surgery.

Thoracic epidural analgesia attenuates the surgical stress response, reduces pain and opioid consumption for up to 72 h but reduces the time to return of gut function.⁹ Hence, its role is now less clear and epidural failure rate as high as 30% makes it an unfavorable option. Whenever TEA is to be used, low-dose local anaesthetic should be combined with a short acting opioid such as fentanyl citrate. The post-operative hypotension may even require treatment with vasopressors. An alternative to TEA is intrathecal morphine (ITM) which allows early mobilization, early removal of urinary catheter and discharge from the hospital.¹⁰ The disadvantage is pruritis associated with its use. Fentanyl, a short acting opioid shows a ceiling effect at 200 mcg dose and does not seem to increase the risk of respiratory depression, if used within this dose range.

In absence of neuraxial block, general anaesthesia can be supplemented with transversus abdominis plane (TAP) block under ultrasound guidance for effective pain relief. A reduced patient controlled analgesia (PCA) morphine use at 24 h and decreased

sedation in patients receiving TAP block has been seen. TAP block is however less effective than ITM at controlling post caesarean pain although the side effects are fewer.¹¹ TAP block and ITM do not have an additive effect. The level of evidence for the use of TAP block is moderate.⁹

Intra peritoneal local anaesthetic (IPLA) has been utilized for postoperative pain management following hysterectomy and has shown better pain scores and reduced morphine consumption, limited to first few hours post surgery only and the analgesia does not seem to be dose responsive.¹²

Wound infiltration with local anaesthetic is also a safe and easy to perform technique but with modest and short lived effects on postoperative pain and opioid consumption.⁹ The analgesia may be prolonged by insertion of subcutaneous wound catheter to provide continuous wound infiltration (CWI). This may provide analgesia equivalent to TEA for abdominal surgery.¹³ The infusion catheter is placed below the abdominal fascia in most studies. The benefit has been shown for first few hours in most studies while some studies have not shown any advantage. Existing data has not supported an increase in wound complication rates, however, the level of evidence of CWI is moderate.

A new agent, liposomal bupivacaine (regular bupivacaine and a non-opiate) can be administered by the surgeon at the time of operation without any discomfort to the patient. Pain relief is equivalent or possibly superior to TEA.

Vaginal Hysterectomy

High volume local anaesthetic infiltration of tissues surrounding the surgical site may be effective at reducing early postoperative pain and opioid consumption and thereby facilitate early mobilisation. Paracervical nerve block is ineffective for cervical dilatation but one study showed postoperative analgesia lasting first few hours after surgery, reduced morphine consumption and early mobilisation¹⁴. There is a low level of evidence of paracervical nerve block or intrathecal morphine to reduce pain and opioid consumption after vaginal hysterectomy.⁹

Laparoscopic Surgery

The advent of laparoscopic and robotic surgery

has diminished the magnitude and duration of visceral pain so that good analgesia is achievable by commonly employed different analgesic techniques.

Multimodal analgesia and the combination of acetaminophen and NSAIDs holds a high level of evidence in reducing pain and its use as a part of ERP. Postoperative nonselective NSAIDs or SI COX2 with morphine improve pain scores, significant morphine sparing effect coupled with decreased sedation, postoperative nausea and vomiting and length of postoperative ileus. Gabapentin has a moderate level of evidence as an analgesic.

Recommendations do not support the use of TAP blocks or IPLA on the current level of evidence.⁵ TEA used for laparoscopic abdominal surgery may prolong hospital stay without any improvement in outcomes. Multimodal analgesia given orally or IV-PCA depending on the magnitude of surgery and predicted postoperative gut function should be used.

Conclusion

Postoperative pain management is an essential component of ERP. It allows greater patient satisfaction, early return to autonomy and discharge from the hospital. A multidisciplinary team approach setting up the acute pain service would enable to achieve the desired analgesia in the postoperative period.

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Lymphadenectomy in Management of Gynaecological Cancers

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The lymph nodes and the connecting lymphatic channels follow the same route as the venous drainage. There is an organized lymphatic system for drainage to the third space interstitial fluid, lymph from extremities and organs back into the circulatory system. This empties into the venous system at the junction of left subclavian vein and internal jugular vein. There is a specific pattern of lymphatic drainage for each gynaecologic organ.

How was Lymphatic Mapping Developed?

The great anatomist John Gray in 1938 wrote that the study of mode of spread of solid tumors to lymph nodes was impeded due to study on putrefied or fixed tissue.

Sappey et al injected a variety of compounds to assist in observing lymphatics in cadaveric tissues. Hudack and Mc Master injected various dyes into dermis of healthy volunteers to study the microlymphatics of skin.

Till middle of 20th century enbloc dissection for solid tumor in continuity with the regional lymphatic channels and lymph node was done. At that time there was no effective non-surgical adjuvant therapy to accompany surgery.

In later half due to advancement in medicine it was recognized that if cancer is detected early, it is curable. Advancement in surgical techniques, critical care, transfusion medicine and antibiotics improved the outcomes.

In the 1970s Ramon Cabanas work in patients with penile carcinoma is considered the start of modern lymphatic mapping. In 1992, Morton and Colleagues described the use of lymphoscintigraphy and intraoperative lymphatic mapping in 237 patients with cutaneous melanoma. Only 2 of 40 lymphadenectomy specimens with positive nodes had falsely negative sentinel nodes.

Surgical assessment of lymph nodes in gynaecological cancers

To improve the outcomes in gynaecologic cancers,

lymph node surgery to debulk disease can help in staging and guiding for adjuvant therapy.

Lymphatic drainage

1. Ovaries and fallopian tubes

The primary drainage follows the gonadal vessels cephalad towards inferior vena cava on right side and towards left renal vein on left side. Ovarian and fallopian tube lymphatic drainage also extend to pelvic lymph node basins.

2. Uterus

It has two prominent pathways. One route drains into the uterine wall through broad ligament and joins the para-aortic drainage course of adnexal structures. Other route follows the uterine vasculature to internal and external iliac lymph nodes as well as those in obturator space. A less common pathway pattern is through the round ligament directly to the inguinal lymph node basin.

3. Cervix

The lymphatic pattern originates at the junction of the cervix and uterine corpus in a paracervical lymphatic plexus. The lymphatic drainage that follows the uterine artery follows the internal and external iliac vessels as well as upto lymph nodes of the obturator space.

Lymphatic vessels also follow the uterine vein posteriorly and travel along internal iliac vasculature. As the drainage routes back to circulatory system, it then transverse lymphatic vessels that climb through the common iliac lymph node chain.

4. Vulva

Lymphatics drain into the superficial and deep inguinofemoral lymph nodes, predominantly through the medial lymph node basin first. Then the drainage continues to the upper pelvic lymph node of external, internal and common iliac vessels.

5. Vagina

Upper two-third of vagina drain into the deep pelvic lymph nodes along the external and internal iliac vessels and into the obturator space. Lower third drain into inguinofemoral lymph node basin.

What is a Sentinel node?

In 1992, Morton & Colleagues defined sentinel node as the first draining lymph node on direct lymphatic pathway from primary tumor site.

With the growing experience it is clear that myriad of anatomic variations of sentinel nodes occur.

Thompson and Uren modified definition by saying that any lymph node that receives lymphatic drainage directly from primary tumor. Sometimes the primary tumor drains into more than one lymphatic basin or two lymph nodes in the same lymphatic basin have direct lymphatic communication with primary tumor.

Technique for Sentinel Lymph node identification

Three categories:-

- Blue dye based
- Pre-operative lymphoscintigraphy
- Intraoperative use of hand held gamma probe

Blue dye based – Blue dye is injected around the tumor before surgery. During surgery the sentinel node is identified by following the path of blue stained lymphatic leading away from tumor. Various dyes used had been isosulfan blue, methylene blue. Isosulfan blue remains visible in sentinel node for 30-45 minutes.

Pre-operative lymphoscintigraphy is performed by injecting weakly radioactive radionuclide around the tumor and then obtaining an image.

Intraoperative use of gamma probe after injection of a radionuclide around the tumor.

Evaluation of Sentinel nodes by Pathologist

Rapid PCR to test cytokeratin 19 (CK-19) was used by Van Trappen in the lymph nodes of patient, who underwent Radical Hysterectomy. In these cases lymphatic mapping was not performed. Highest concentration of CK-19 positive nodes corresponded with the most common sites of sentinel nodes.

Is there a role for pre-operative lymphoscintigraphy in treating gynaecologic cancer?

Its main use is in patients with tumors that may have lymphatic drainage to more than one lymphatic basin. All early vulvar tumor drain to groin.

Preoperative lymphoscintigraphy in patients with vulvar cancer may help determine lymphatic basin at risk for metastasis before surgery. It may provide a method to determine when bilateral dissection or treatment is needed and when a unilateral approach will suffice.

How long is the learning curve for lymphatic mapping and sentinel node identification for Gynaecologic Oncologist?

According to the Giuliano '**see one, do twenty five, teach one is recommended**'. There are no data on accuracy specifically for Gynaecologic Oncologist, however, accuracy increase and false negative rates decrease with experience.

Early stage ovarian cancer

The main aim in such cases is to appropriately stage the cancer.

Prognosis is excellent with low grade stage IA and IB, if it is well staged. These do not need any adjuvant chemotherapy.

If occult lymph node metastasis remains undetected, patient will be understaged. The standard approach for surgical lymph node assessment is that of comprehensive pelvic and para-aortic lymphadenectomy. Limited data is available for sentinel lymph node biopsy for ovarian cancer. The data suggests that the sentinel node is most often within the para-aortic nodal basin (60% isolated para-aortic, 30% both para-aortic and pelvic).

High grade serous tumors, high serum CA125, B/L masses and ascites give an indication for lymph node involvement. Stage I high grade serous tumor have 28% likelihood of having positive lymph nodes as compared in 11% lymph node metastasis with low grade stage I serous carcinomas. Whereas mucinous and endometrioid have less than 1% likelihood of lymph node positivity. So it appears safe to avoid lymphadenectomy in mucinous ovarian cancer staging.

Unilateral lymphadenectomy for unilateral ovarian lesion have been suggested because the rate of bilateral nodal involvement in the setting of a unilateral lesion and positive node is 40% and contralateral isolated nodal involvement appears to be as high as 10%. Therefore bilateral lymphadenectomy should be done in the staging of otherwise early stage ovarian cancer.

Advanced stage ovarian cancer

Recently published randomized trial of lymphadenectomy versus no lymphadenectomy in macroscopically complete ovarian cancer primary resection revealed median overall survival of 69 months as compared to 65.5 months in no lymphadenectomy group, median PFS was same (25.5 months) in both groups. Morbidity of complications was double 12.4 % versus 6.5% and mortality rate was tripled 3.1% versus 0.9%

If the nodes are bulky, they can be removed at the time of primary debulking surgery.

Trial of systemic lymphadenectomy is targeted removal of bulky lymph nodes was done by Panici et al in stage III C and stage IV ovarian cancer. Median PFS was longer in systemic group as compared to targeted group, but there were higher risks of complications in systemic group.

So, the risks associated with removing normal sized lymph nodes in advanced ovarian cancer may outweigh the benefit.

Endometrial Cancer

In moderate and high risk carcinoma endometrium surgical lymph node assessment is a critical part.

Mariani et al introduced a comprehensive approach to pelvic and para aortic lymph node assessment through systematic lymphadenectomy Mayo criteria of low risk for lymphatic spread were reinforced which included grade 1 or 2 tumor on histopathology, myometrial invasion of less than 50% and maximum tumor diameter of less than 2 cms. It was seen that 30% of women with Ca endometrium with these criteria have low risk for lymph node spread and one can avoid surgical lymph node dissection in these women.

The concept of sentinel lymph node biopsy has been introduced to assess the lymph node in Ca

endometrium, Various methods for identification of SLN by injecting dye have been used. There is 25% higher rate in successful mapping by indocyanine green (ICG).

SLN in endometrial cancer can be found in para aortic lymph node involvement in 1 to 2% of cases. However when mapping of SLN is not done, it is recommended to proceed with systematic pelvic lymphadenectomy.

Clinical stage & grade versus pelvic and aortic node metastasis

Stage	Pelvic nodes	Aortic nodes
Ia G1 (n=101)	2 (2%)	0 (0%)
Ia G2 (n=169)	13 (8%)	6 (4%)
Ia G3 (n=76)	8 (11%)	5 (7%)
Ib G1 (n=79)	3 (4%)	3 (4%)
Ib G2 (n=119)	12 (10%)	8 (7%)
Ib G3 (n=77)	20 (26%)	12 (16%)

Cancer 60:2035, 1987

Relationship between Depth of Myometrial Invasion and Five-Year Survival

Stage survival	No. of patients	Five-year
1aG1	698	93%
1bG1	1030	88%
1cG1	442	87%
1aG2	229	91%
1bG2	1307	93%
1cG2	485	84%
1aG3	66	75%
1bG3	280	82%
1cG3	247	66%

Maximal invasion and node metastasis

Maximal invasion	Pelvic nodes	Aortic nodes
Em. Only (n=87)	1 (1%)	1 (1%)
Superficial muscle (n=279)	15 (5%)	8 (3%)
Intermediate muscle (n=116)	7 (6%)	1 (1%)
Deep Muscle (n=139)	35 (25%)	24 (17%)

Cancer 60:2035, 1987

Literature support concept of target based management of early endometrial cancer. Complete pelvic and paraaortic node dissection should be encouraged for all early stage lesion other than grade 1 or 2 endometroid carcinoma with primary tumor 2 cms or less and invading only the inner half of myometrium. The merits

of performing systematic lymphadenectomy are diagnostic, prognostic and therapeutic.

Uterine Sarcoma

Endometrial stromal carcinoma and uterine carcinosarcoma are now considered to be a part of endometrial carcinoma.

There are no large studies available for role of lymphadenectomy in these two.

In uterine leiomyosarcoma metastasis is haematogenous so lymph node assessment is not indicated in leiomyosarcoma with normal appearing lymph node.

Cervical Cancer

Metastasis to para aortic lymph nodes is rare in cervical cancer. The prospective trial SENTICOL tested the accuracy of SLN in patients with Ca cervix stage IAI with LVS invasion upto stage 1B1. It was found to be 92% sensitive in detecting positive LN with 98% NPV where bilateral SLN were detected, there were no false negative SLN. In stage, 1B1 or more cervical cancer role of SLN as a replacement for complete lymphadenectomy is still unclear. However excision of bulky lymph nodes may improve oncologic outcomes.

Vulval Cancer

Now it is evident that lymphatic drainage of vulva is not only to superficial inguinal nodes but also to deeper inguinofemoral nodes and needs removal of both nodes. There is 50% risk of wound complication.

So to optimize morbidity concept of sentinel inguinofemoral lymph node biopsy was introduced. GROIN SS- V- I and GOG 173 clinical trial confirm the safety of SLN as compared to total lymphadenectomy.

Unilateral vulvar cancer >1 mm, invasion < 4 cms. NPV 2% (Negative SLN).

5 years isolated groin recurrence is 2.5% in negative SLN.

So the use of combination of tectinetium and blue dye trace has lowest rate of missed positive nodes. Tumor < 1mm invasion (FIGO IA) do not require surgical lymph node assessment as risk of LN spread is low but with tumor > 4 cms have risk of spread. So there is role for SLN utilization in cases with larger tumor.

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COVID-19: We Shall Overcome

Gurudev Sri Sri Ravi Shankar

The coronavirus pandemic has created a global crisis with far-reaching social, economical and spiritual repercussions. Our resilience during these challenging times will be tested not only by how we combat the spread of the virus but also how we make the best out of the circumstance. While it is important to take this pandemic seriously and act responsibly it is definitely not the time to panic.

Beating the virus requires collective action. It's imperative that everyone follows the rules like staying clean, washing the hands frequently, maintaining social distance etc. Initially, they might appear challenging, but they aren't hard to practice. If you observe, these mannerisms have been part of many traditional cultures. The ancient philosophy of yoga lays a great deal of emphasis on cleanliness, not only of the body but also of the mind and the surroundings.

The first personal ethics of yoga or Pranayama is about cleanliness or saucha. Saucha, as enunciated in the Yoga Sutras of Maharishi Patanjali, advocates purity and cleanliness as a key foundation for yogic life. Saucha in its deeper sense also includes avoiding unnecessary physical contact and intimacy. The self-discipline of eating healthy and chemical-free food which keeps us clean from within is complementary to saucha. It also includes the discipline to sleep enough, to work out, to meditate and the like, anything that leads to purification of our system. Making asanas, pranayamas and meditation an integral part of lifestyle can go a long way in boosting one's immunity and keeping the Coronavirus at bay.

The most important contribution we can make during these tumultuous times is to isolate ourselves to reduce the possibilities of contracting and transmitting the virus. Stay indoors, avoid travelling and going to public gatherings or community feasts. I would recommend even avoiding congregational prayers and rituals. Meditation and mental prayers are far superior and much more effective than rituals. Take the imposed social distancing or self-quarantine as an opportunity to slow down and go inward. It offers you space and time to focus on

yourself, to reflect and reset your roles and goals. It is also an excuse to break the monotonous pattern of fast-paced life and indulge in some right-brain activities like creative writing, cooking, music, painting or learning a language. It's the time to move beyond the scenery and find the lost seer. It's also the time to strike a balance between rest and activity. One who is always in rest doesn't progress in life and one who is always in activity misses the bliss of deep rest.

Social distancing is not a punishment. Silence and solitude are a potent means for personal growth and self-renewal. Many great works of the world have emerged out of solitude. Meditate more and use this forced solitude to improve your mental strength, creativity, empathy, and productivity. Now that you are getting to spend more time with your family members, listen to them. Talk less and avoid arguments.

So far, India has done extremely well in combating the spread of Coronavirus, but there is a lot more to do. During catastrophic events, people must care for and share with each other. The haves should resort to some austerity and spend the savings on those who are in dire needs. I urge all those who can afford, to take a pay cut and form endowments to take care of daily wage earners and low-income groups in their areas so that the economic burden is shared by society locally. Let's reassure ourselves and others that there is enough humanity to take care of everyone.

This is a temporary phase of uncertainty. Mankind has fought against and prevailed over such threats before. We have overcome epidemics like SARS, Swine flu and bubonic plague in the past. Be assured that we will overcome this one too. I request everyone to desist from circulating unfounded information about the pandemic. While we need to be informed of what is happening, do not get obsessed with Corona. Endless TV debates and mindless social media shares could add to the uncertainty and cause an upsurge of anxiety and panic.

The Coronavirus is definitely a catastrophe for the world, but it doesn't have to mean the Apocalypse. Despite the dark clouds of gloom, silver linings are emerging bright enough to bring hope. This is what we need to focus on. The stories of birds chirping again in Wuhan or skies and water bodies clearing up as people stay indoors or people opening up their hearts to provide solace to those who are in need might

not immediately compensate the losses brought about by the novel pandemic, but they do come as lasting reassurances of the good for the human race. For sure, this crisis will also leave the population more sensitized about cleanliness, personal hygiene and healthy ways of life.

Time indeed is the great healer. Let's give Time, time with patience, courage and compassion.

Part - 2

Organisational challenges faced while dealing with Covid-19 & Sars-Cov-2 Positive Pregnant Women

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As COVID positive cases are on the rise, especially as lockdown is being gradually eased, the health care facilities are going to be faced with increasing number of pregnant women with COVID positive reports.

Some facilities like the central & states Govt. Hospital have been in the forefront of managing these COVID positive pregnant women since the pandemic started.

They have been caring for these patients very diligently and with great alacrity so that minimum morbidity and mortality is encountered. Sir Ganga Ram Hospital has been in the forefront also in handling COVID positive cases with pregnancy

Structured proforma was sent to various facilities regarding the organisation and clinical challenges faced while dealing with COVID -19 and Sars-CoV-2 positive pregnant women.

The following is the summary of the above along with recommendations made by these facility incharges.

Pyramid of Care Givers

The head of the department followed by nodal officer and then specialist followed by senior residents and junior residents.

No. of Residents posted in COVID ward (Junior / Senior)

Number of JR, SR varied depending upon the patient load of the facility (8-28). Mid level Faculty was posted in COVID ward on weekly rotation.

No. of Staff nurses

Number of the staff nurses posted in COVID ward varied from 8- 38 per day depending on the patient load.

Duty hours

6 hrs shifts to 12 hrs shifts. Shorter shifts were in the

hospitals where number of patients was very high.

Duration of posting in COVID- ward

14 days

Post duty quarantine

Post duty quarantine was followed in most facilities after the posting.

Accommodation (Boarding /lodging) during COVID- 19 posting

Accommodation (Boarding & lodging) was provided by the health facility in either a hotel or lodge.

Challenges Encountered while Establishing the set-up/ Bottle Necks Faced?

1. Identification of suitable and appropriate location for setting up COVID wards.
2. Lack of cooling facilities due to logistic issues .
3. Shortage of beds as number of COVID positive patients increased.
4. Structural modification of the area into green, orange and red zones given the time constraints.
5. Training of HCW in infection control practices.
6. Delegation of duties to various levels of HCW.
7. Motivating the frontline workers and allaying their anxiety while working with Sars-Cov-2 positive patients.
8. Difficulties encountered by HCW in working for long hours while wearing PPE.
9. Triaging at the reception area for women who arrived in advanced labour with unknown COVID status, so as to decide whether to send them to green zone/red zone.

How these Administrative Hurdles were Overcome

1. Architectural modifications in the given areas were done. Bigger and more spacious labour was constructed with exhaust fan and window AC

2. Area specific administrative heads appointed from the faculty members to ensure adequate supply of PPE, ensuring compliance for using of PPE, daily meeting with residents, nurses to solve their day to day problems.
3. ICMR + CDC guidelines for testing, quarantine, appropriate donning and doffing of PPE were put up on notice boards all over the COVID ward to disseminate the information.
4. Committee of 3 senior faculty members was constituted to do contact tracing, assessment of level of exposure and to decide need for quarantine and Sars-CoV-2 RTPCR testing.
5. Regular meetings between administrative team and obs faculty members to identify the problems and find solutions.
6. Mock drills and dry runs were done before starting the facility.

Quarantine guidelines followed for pregnant women in COVID-19 pandemic

As per the MOHFW guidelines revised from time to time depending upon the level of exposure (defined by the CDC).

Protocol for admitting all asymptomatic Sars-CoV-2 positive pregnant women and for how long?

Sars-Cov-2 positive pregnant women were referred to dedicated COVID hospitals where they were kept admitted for 10 days from the date of the positive report and till they were asymptomatic and the repeat testing was negative.

Later on, positive patient who were asymptomatic and were remote from delivery date were home monitored. Only those positive asymptomatic women who were not willing for home isolation or were close to their EDD were admitted.

Training and managing the healthcare cadre.

This was done through regular orientation programme arranged by microbiology department/ administration personnel, regular updates via official whatsapp groups.

Tips for smooth running of COVID-19 facility

1. Have a standard operating procedures in place.
2. Team building.
3. Effective leadership.

4. Empowerment of health care providers with knowledge.
5. Provision of appropriate PPE, smooth and adequate flow of PPEs.
6. Daily meeting with frontline teams and prompt trouble shooting.
7. Training for donning and doffing and other infection control and prevention practices by Microbiology Dept.
8. Motivation of staff for duty.
9. Making suitable duty roster acceptable to all.
10. Always keep reserve list of all HCWs.

Comments

Though initiation was a problem, but once the services were established, it gave immense satisfaction as we do not have to face the discomfort of referring our positive patients to other hospitals most of which are unwilling to take the cases. Moreover segregating the patients at the initial triage even the suspect patients decreases exposure of other co-patients and HCWs.

Practical challenges or hurdles faced by the facility while dealing with Corona positive pregnancy cases

1. Shifting the patient to a COVID facility after ensuring availability of bed and arranging ambulance
2. Donning PPE and performing LSCS and other surgeries was very difficult and uncomfortable.
3. Continued training of staff.
4. Changing posting of HCW with inadequate training and fear among them

Obstetric USG guidelines followed Corona positive patient

USG machine in COVID suspect labour room used for USG & only emergency indication

Bed side ultrasound were done.

Criteria for discharge

Assessment by physician about severity of disease. If mild/ presymptomatic, women were discharged and advised to follow home isolation guidelines or shift to COVID care centre women who were near term or had no home isolation facility were kept admitted indoor.

MOHFW discharge guidelines (8/5/2020)

Comments

1. Tertiary hospital should not be a COVID facility
2. COVID and Non-COVID facilities should be separate
3. More staffing is needed to work at dedicated work stations
4. Counselling to allay fears amongst staff (Esp. contractual workers)
2. Motivation of HCWs.
3. Daily meeting to solve day to day problems.
4. Simulation of work flow in emergencies (dry run)
5. Create visual PPE donning and doffing check list in OT.
6. Create visual work flow in OT.
7. Create kits and check lists for caesarean delivery - kits, drugs, epidural kits.

Concluding remarks

It was indeed a challenge for the health facilities to gear themselves up to face the COVID -19 onslaught. Some take home points are as follows:

1. Standard operating protocol to be strictly followed.
8. **DROPLET AND CONTACT PRECAUTIONS**
9. Debriefing.

Coronavirus (COVID-19) Infection in Pregnancy: Information for Healthcare Professionals

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Introduction

SARS-CoV-2 is a new coronavirus, and therefore the evidence currently available to guide clinical management in this specific situation is of low quality. **This guideline released by RCOG dated 4th June 2020 provides updated information on Coronavirus Infection in Pregnancy⁽¹⁾.**

On 20 March 2020, the UK Obstetric Surveillance System (UKOSS) launched a registry for all women admitted to UK hospitals with confirmed COVID-19 infection in pregnancy. The World Health Organization (WHO) publishes a daily international situation report with an additional Situation Dashboard to provide information for individual countries⁽²⁾.

Transmission

Most global cases of COVID-19 have evidence of human-to-human transmission. This virus can be readily isolated from respiratory secretions, faeces and fomites (objects). Transmission of the virus is known to occur through close contact with an infected person (within 2 metres) or from contaminated surfaces.

Pregnant women do not appear more likely to contract the infection than the general population. Pregnancy itself alters the body's immune system and response to viral infections in general, which can occasionally cause more severe symptoms. This may be the same for COVID-19 but there is currently no evidence that pregnant women are more likely to be severely unwell needing admission to intensive care or die from the illness than non-pregnant adults.

Effect of COVID-19 on Pregnant Women

There is evolving evidence within the general population that there could be a cohort of asymptomatic individuals or those with very minor symptoms who are carrying the virus, although the prevalence is unknown. Most pregnant women

will experience only mild or moderate cold/flu-like symptoms. Cough, fever, shortness of breath, headache, anosmia and loss of taste are other relevant symptoms. More severe symptoms which suggest pneumonia and marked hypoxia are widely described with COVID-19 in older people, the immunosuppressed and those with chronic conditions such as diabetes, cancer or chronic lung disease. The symptoms of severe infection are no different in pregnant women and early identification and assessment for prompt supportive treatment is key.

Risk factors for hospital admission with COVID-19 infection in pregnancy

Risk factors that appear to be associated with hospital admission with COVID-19 illness include:

1. Black, Asian or minority ethnicity (BAME)
2. Overweight or obesity
3. Pre-existing comorbidity
4. Maternal age >35 years

The characteristics of women admitted to hospital with COVID-19 in the data from the UKOSS study were compared with controls derived from a historical cohort of women giving birth between 1 November 2017 and 30 October 2018 (n=694)⁽³⁾. Pregnant women admitted to hospital with COVID-19 during the 2020 pandemic were more likely to be of black or other minority ethnicity, have pre-existing comorbidity, be aged over 35 years or be overweight (BMI of 25–29 kg/m²) or obese (BMI 30–39 kg/m²).

Lifestyle measures such as regular exercise, a healthy diet and vitamin D supplementation are recommended in pregnancy and throughout life to prevent obesity, type 2 diabetes mellitus and vitamin D deficiency⁽⁴⁾.

Effect of COVID-19 on the Fetus

There are currently no data suggesting an increased risk of miscarriage in relation to COVID-19. Case

reports from early pregnancy studies with SARS-CoV and MERS-CoV have not demonstrated a significant relationship between infection and increased risk of miscarriage or second trimester loss⁽⁵⁾.

Antenatal care during the COVID-19 pandemic

What are the considerations for organisation of antenatal care?

- Women should be advised to continue their routine antenatal care, although it may be modified, unless they meet current self-isolation criteria for individuals or households with suspected or confirmed COVID-19.
- Service modifications are required to assist women practising social distancing measures, to reduce the risk of transmission between women, staff and other clinic/hospital visitors, and to provide care to women who are self-isolating for suspected/confirmed COVID-19 but for whom a hospital attendance is essential.
- Basic assessments such as blood pressure and urine testing are still required. Trusts should plan local strategies to ensure women receive this monitoring.
- Units should employ teleconferencing and videoconferencing where possible and consider which appointments can be most appropriately conducted remotely.
- When in-person appointments are required (e.g. for blood tests, maternal examination or ultrasound scans), these should be arranged alongside other face-to-face maternity appointments to limit repeated clinic attendance.
- Particular consideration should be given to pregnant women who are 'shielding'. These women should be provided with a mask during hospital visits and shared waiting areas should be avoided.
- Women should be able to notify the unit regarding self-isolation for COVID-19 using standard telephone numbers that are already available to them.
- For women receiving antenatal care across different sites, units must ensure that there are clear pathways for communication via handheld notes, electronic records and correspondence to general practitioners.
- Clinicians should be aware of specific changes to services which have been suggested via regularly updated, subspecialty service guidance available via the RCOG website.

How should prevention of venous thromboembolism be addressed during the COVID-19 pandemic?

- Women who are self-isolating at home should stay well hydrated and mobile throughout this period.
- Women should have a venous thromboembolism (VTE) risk assessment performed during their pregnancy as per the RCOG Green-top Guideline No 37a⁽⁶⁾. Infection with SARS-CoV-2 should be considered as a transient risk factor and prompt reassessment.
- Women already prescribed thromboprophylaxis should continue administering it.
- Thromboprophylaxis commenced for pregnant women who are self-isolating should continue until they have recovered from the acute illness (between 7 and 14 days). For women with ongoing morbidity and limited mobility, advice from a clinician with expertise in VTE should be sought.
- All pregnant women admitted with confirmed or suspected COVID-19 should receive prophylactic LMWH, unless birth is expected within 12 hours.
- For women with severe complications of COVID-19, the appropriate dosing regimen of LMWH should be discussed in a multidisciplinary team (MDT) that includes a senior obstetrician or clinician with expertise in managing VTE in pregnancy.
- All pregnant women who have been hospitalised and have had confirmed COVID-19 should receive thromboprophylaxis for 10 days following hospital discharge. For women with persistent morbidity, consider a longer duration of thromboprophylaxis.
- If women are admitted with confirmed or suspected COVID-19 within 6 weeks postpartum, they should receive thromboprophylaxis for the duration of their admission and for at least 10 days post discharge. Consider extending this until 6 weeks postpartum for women with significant

ongoing morbidity.

Key considerations when caring for women with suspected/confirmed COVID-19 during labour and birth

Setting for birth

If homebirth or birth in a midwifery-led unit is planned, a discussion should be initiated with the woman regarding the potentially increased risk of fetal compromise in active phase of labour if symptomatic with SARS-CoV-2.60 Attending an obstetric unit, where the baby can be monitored using continuous electronic fetal monitoring (EFM), should be recommended for birth.

Timing for birth

A positive COVID-19 result in an otherwise well woman, when there is also no evidence of fetal compromise, is not an indication to expedite birth.

Induction of labour (IOL) is associated with longer periods of inpatient stay than for spontaneous onset of labour.

Review the indication for IOL and consider whether the likely benefits outweigh possible risks. Where possible, review the provision and possibility of outpatient IOL.

For women who are currently in a period of self-isolation because of suspected COVID-19 in themselves or a household contact, an individual assessment should be made to determine whether it is safe to delay scheduled appointments for pre-operative care and elective caesarean birth, or IOL if planned to occur during their period of self-isolation.

The individualised assessment should consider the urgency of the birth, and the risk of infectious transmission to other women, healthcare workers and, postnatally, to her baby.

Mode for birth

There is currently no evidence to favour one mode of birth over another in women who are SARS-CoV-2 positive, so mode of birth should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention.

Mode of birth should not be influenced by the

presence of COVID-19, unless the woman's respiratory condition demands urgent intervention for birth.

The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given that SARSCoV- 2 has been identified in faeces and that commonly available personal protective equipment (PPE) is not waterproof.

An individualised informed discussion and decision should be made regarding shortening the length of the second stage of labour with instrumental birth in a symptomatic woman who is becoming exhausted or hypoxic.

In case of deterioration in the woman's symptoms, an individual assessment should be made regarding the risks and benefits of continuing the labour versus proceeding to emergency caesarean birth, if this is likely to assist efforts to resuscitate the woman.

Donning PPE is time-consuming. For emergency caesarean births, this may impact on the decision to delivery interval but it must be done. Women and their families should be told early about this possible delay.

Birth partners

Women should be supported and encouraged to have a birth partner present with them during their labour and birth. Having a trusted birth partner present throughout labour and birth is known to make a significant difference to the safety and wellbeing of women in childbirth.

At a minimum, one asymptomatic birth partner should be permitted to stay with the woman through labour and birth, unless the birth occurs under general anaesthetic.

When a woman contacts the maternity unit in early labour, she should be asked whether she or her birth partner have had any symptoms which could suggest COVID-19 in the preceding 7 days. If her partner has had onset of symptoms in the last 7 days, the woman should be advised that her partner should not attend the unit with her and she should consider bringing another birth partner who is symptom-free.

We recommend that birth partners be given clear advance guidance on what is expected of them should they need to accompany the woman to the

operating theatre – e.g. for caesarean birth. This is particularly important given the challenges of staff communication when wearing full PPE.

Respect and consent

Women must still be able to make decisions about the care they receive in line with the principles of informed consent.

Timing for birth

Discuss with women the options for fetal surveillance in labour in accordance with existing NICE guidelines⁽⁷⁾.

Recommend continuous EFM for women who are symptomatic of COVID-19.

Current infection with SARS-CoV-2 is not a contraindication for application of a fetal scalp electrode or for fetal blood sampling.

Fetal surveillance

There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses.

Epidural analgesia should therefore be recommended in labour, to women with suspected or confirmed COVID-19 to minimise the need for general anaesthesia if urgent intervention for birth is needed.

Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.

There is no evidence that the use of Entonox is an aerosol-generating procedure (AGP).

Pain relief

There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses.

In early labour, the midwife caring for the woman may initiate a discussion with a woman with symptomatic or confirmed COVID-19 about the potential benefit of epidural analgesia to minimise the need for general anaesthesia if urgent intervention for birth is needed.

Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.

There is no evidence that the use of Entonox is an AGP.

Intrapartum care

When a woman with confirmed or suspected COVID-19 is admitted to the maternity suite, the following members of the multidisciplinary team should be informed: consultant obstetrician, consultant anaesthetist, midwife-in-charge, consultant neonatologist, neonatal nurse in charge and infection control team.

Maternal observations and assessment should be continued as per standard practice, with the addition of hourly oxygen saturations.

Aim to keep oxygen saturation above 94%, titrating oxygen therapy accordingly.

If the woman develops a fever, investigate and treat as per RCOG guidance on sepsis in pregnancy⁽⁸⁾, but also consider active COVID-19 as a cause of sepsis and investigate according to PHE guidance⁽⁹⁾.

Apply caution with intravenous fluid management. Given the association of COVID-19 with acute respiratory distress syndrome, women with moderate-to-severe symptoms of COVID-19 should be monitored using hourly fluid input/output charts.

Efforts should be targeted towards achieving neutral fluid balance in labour, in order to avoid the risk of fluid overload.

Immediate neonatal care

The neonatal team should be given sufficient notice of the birth, to allow them to attend and don PPE before entering the room/theatre.

Given a lack of evidence to the contrary, delayed cord clamping is still recommended following birth, provided there are no other contraindications. The baby can be cleaned and dried as normal, while the cord is still intact.

Infection control

On arrival to hospital, women with suspected/confirmed COVID-19 should immediately be escorted to an isolation room or cohort bay/ward, suitable for the majority of care during their hospital visit or stay.

Isolation rooms or ward bays should ideally have a defined area for staff to put on and remove PPE,

and suitable bathroom facilities.

Only essential staff should enter the room and visitors should be kept to a minimum.

All non-essential items from the clinic/scan room should be removed prior to the woman's arrival.

Pain relief

When a woman with confirmed or suspected COVID-19 is admitted to the maternity suite, the following members of the MDT should be informed: consultant obstetrician, consultant anaesthetist, midwife-in-charge, consultant neonatologist, neonatal nurse in charge and infection control team.

Maternal observations and assessment should be continued as per standard practice, with the addition of hourly oxygen saturations.

Aim to keep oxygen saturation more than 94%, titrating oxygen therapy accordingly.

If the woman develops a fever, investigate and treat as per RCOG guidance on sepsis in pregnancy, but also consider active COVID-19 as a cause of sepsis and investigate according to PHE guidance.

Apply caution with IV fluid management. Given the association of COVID-19 with acute respiratory distress syndrome, women with moderate to severe symptoms of COVID-19 should be monitored using hourly fluid input/output charts.

Efforts should be targeted towards achieving neutral fluid balance in labour, in order to avoid the risk of fluid overload.

Infection control

Particular advice from Public Health England on type and specification of PPE for different maternity settings is available. All clinical areas used must be cleaned after use, as per health protection guidance.

Labour and birth during the COVID-19 pandemic

How should obstetric theatres be managed during the COVID-19 pandemic?

- Elective obstetric procedures (e.g. cervical cerclage or caesarean birth) planned for women with suspected/confirmed COVID-19 should be scheduled at the end of the operating list.
- Emergency procedures for women with suspected/confirmed COVID-19 should be

carried out in a second obstetric theatre, where available, allowing time for a full postoperative theatre clean as per national health protection guidance.

- The number of staff in the operating theatre should be kept to a minimum, and all must wear appropriate PPE.
- Anaesthetic care for women with suspected or confirmed COVID-19 should be with reference to guidance from Royal College of Anaesthetists/Obstetric Anaesthetists' Association.
- The use of PPE causes communication difficulties in obstetric theatres so checklists should be used with closed loop communication.

How should a woman with suspected/confirmed COVID-19 who is clinically deteriorating be cared for?

- Hourly observations should include respiratory rate and oxygen saturation, monitoring both the absolute values and trends.
- Signs of decompensation include an increase in oxygen requirements or $FiO_2 > 40\%$, a respiratory rate $>30/\text{min}$, reduction in urine output, or drowsiness, even if oxygen saturations are normal.
- Escalate urgently if any signs of decompensation develop.
 - Young, fit women can compensate for a deterioration in respiratory function and are able to maintain normal oxygen saturations until sudden decompensation.
 - Signs of decompensation include an increase in oxygen requirements, an increasing respiratory rate despite oxygen therapy, an acute kidney injury or drowsiness even if the saturations are normal.
- Titrate oxygen flow to maintain saturations $>94\%$.
- Have a low threshold to start antibiotics at presentation, with early review and rationalisation of antibiotics if COVID-19 is confirmed. Even when COVID-19 is confirmed, remain open to the possibility of another co-existing condition.
- Suspected COVID-19 should not delay administration of therapy that would usually be given (e.g. intravenous antibiotics in woman with fever and prolonged rupture of membranes).
- Until test results are available, a woman with

suspected COVID-19 should be treated as though it is confirmed.

- An MDT planning meeting should be urgently arranged for any unwell woman with suspected/confirmed COVID-19. This should ideally involve a consultant physician, consultant obstetrician, midwife-in-charge, consultant neonatologist, consultant anaesthetist and intensivist responsible for obstetric care. The discussion should be shared with the woman and her family if she chooses.
- All pregnant women should have a VTE assessment and be prescribed prophylactic dose thromboprophylaxis, unless there is a suspicion of a VTE when therapeutic dose thromboprophylaxis should be administered.
- For women with thrombocytopenia (platelets <50), stop aspirin prophylaxis and thromboprophylaxis and seek haematology advice.
- Be aware of possible myocardial injury, and that the symptoms are similar to those of respiratory complications of COVID-19.
- Apply caution with intravenous fluid management:
 - Women with moderate-to-severe symptoms of COVID-19 should be monitored using hourly fluid input/output charts.
 - Efforts should be targeted towards achieving neutral fluid balance in labour.
 - Try boluses in volumes of 250–500 ml and then assess for fluid overload before proceeding with further fluid resuscitation.
- The frequency and suitability of fetal heart rate monitoring should be considered on an individual basis, accounting for the gestational age and the maternal condition.
- An individualised assessment of the woman should be made by the MDT to decide whether emergency caesarean birth or IOL is indicated, either to assist efforts in maternal resuscitation or where there are serious concerns regarding the fetal condition.
- Antenatal steroids for fetal lung maturation should be given when indicated by NICE guidance but urgent intervention for birth should not be delayed for their administration.
- Consider administering magnesium sulphate cover for fetal neuroprotection irrespective of steroid status, but do not delay to administer the magnesium sulphate if urgent birth is indicated.

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Contraception in Covid 19 Scenario

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The unprecedented Covid 19 pandemic has triggered large-scale anxiety to all sections of the society and has illuminated the need to upscale health infrastructure globally. Similar to previous pandemics covid 19 also gave a major blow to women's health physically, mentally and emotionally. As we gradually learn to manage and minimize its effects on the human population, it is important to consider the deepening effects made to overall wellbeing of females.

The family planning services witnessed major setback during the initial days of lockdown with woman losing the ability to plan their family. Contraception and abortion services were never in the agenda of essential services by the policy makers worldwide and this has caused a huge implication in a short period of time. A report by UNFPA projects that 47 million women in low and middle income countries are unable to use modern contraceptives, leading to seven million unintended pregnancies in the coming months.¹ With the country in a state of complete lockdown and limited access to contraceptives agents experts are expecting a "coronavirus boom" in December 2020 and an entire generation of "quaranteens" in 2033.² In a country of about 357 million reproductive-age women, any diminution in family planning services could be catastrophic. An analysis, conducted by the Foundation for Reproductive Health Services (FRHS) India, estimates that nearly 2.56 crore couples may not be able to access contraception services during the period after the lockdown and until the return of normalcy by September. This will lead to a loss of 6.9 lakh sterilization services, 9.7 lakh intra-uterine contraceptive devices (IUCDs) and 40.59 crore condoms, among other forms of contraception. As a result, there will be an additional 23 lakh unintended pregnancies, 6.79 lakh child births, 14.5 lakh abortions (including 8.34 lakh unsafe abortions) and 1,743 maternal deaths³. The overall adverse impact on FP programme in 2020 is estimated to be between -15% to -23% in terms of Couple Years of Protection compared to 2019³. The report also concluded that India may

see at least two million unintended pregnancies, with more than half of them ending in abortions, a large proportion of which would involve unsafe procedures.

With the spike in domestic violence, job insecurities, financial dependence on partners, the fear of unwanted pregnancies and inaccessibility to safe abortion practices women health has seen devastating effects both physically and emotionally.

The Problem

Reproduction is a basic human right and so is the access to contraception. The COVID-19 pandemic is showing a negative effect on the production and transportation of contraceptive commodities. A report from Guttmacher institute New York has claimed that a 10% proportional decline in use of short- and long-acting reversible contraceptive methods in low and middle income countries due to reduced access would result in an additional 49 million women with an unmet need for modern contraceptives and an additional 15 million unintended pregnancies over the course of a year⁴. The delay in procuring these pharmaceutical ingredients due to covid restrictions would slowdown production of contraceptives. Owing to the concerns over the expected supply-chain shortage, India too decided to restrict export of 26 pharmaceutical ingredients with products containing progesterone being one of them. This escalated concerns related to global supply shortages of contraceptives⁵ Reports of declined production and supplies have been pouring from many countries. A Malaysian company Karex, which supplies barrier contraceptives to many companies as well as governments had to close three of its manufacturing units in the initial days of lockdown.⁶ Both Zimbabwe and Uganda are staring at a potential shortage in contraceptives due to delay and complications in shipping clearances. Experts believe that Zimbabwe's supplies would run out in two or three weeks if the expected consignments did not arrive on time. In

Uganda, there is already a shortage of implants and emergency contraceptives.⁷

Apart from the team involved in production of contraceptives the people previously deployed to distribute these essentials to women were withdrawn from this task² were engaged in front lines and the usual work was replaced by coronavirus monitoring. Although there was no service provider for contraceptives, Indian women lack the initiative to demand contraceptive agents from their husbands. While chemists are open, the footfall is quite low. People are more comfortable to purchase over the counter contraception, from a store that's away from their neighborhoods. With the restricted transport and lockdown restrictions, that option is gone.

Hospitals are also making arrangements for dealing with Covid related complications and many services considered non-essential are being converted into isolation wards, triage areas and sample testing areas. Apart from the infrastructural amendments the staff was also redirected for covid work thus impairing family planning services. With half of the staff attending the services during the initial period of lockdown family planning OPDs were shut down at many hospitals. Many women missed their scheduled doses of DMPA and were lost to follow up. The routine sterilization services were also stopped since elective and non-life saving surgeries were not taken place. It would be difficult and challenging to demotivate such women amidst the prevailing crisis.

The Effects

Due to monetary issues, lack of resources and inability to demand sexual and reproductive rights, access to health care is already a challenge for women. For a developing country like India unwanted pregnancy is a huge public health concern that leads to unsafe abortions and high maternal mortality. The time bound nature of abortion and the legal aspects surrounding it, however, could eventually end up denying the women this option altogether. There is also a debate on whether abortion should be considered as an essential service at all? It was only when India extended the lockdown after the initial 21-day period that family planning and abortion

services were added to the list of essential services. If restrictions on birth control services continue past September, the number could rise to 10.4 lakh.⁸ With the Ministry of Health and Family Welfare suspending sterilizations and insertion of IUCDs at public facilities until further notice, and restricted movement due to the lockdown making the commercial market less accessible, an additional 2.38 million unintended pregnancies are likely⁸. Abortions are already restricted in many parts of the world. Although, a report has stated that many states in the USA are also contesting on the right to abortions, an order released on April 22, 2020, has allowed abortion facilities in Texas to resume both medical and surgical abortions in return for preserving a certain number of beds for COVID-19 patients⁹.

Women who have been denied abortion may either continue pregnancy or approach untrained people who offer abortion services at cheaper rates without proper medical supervision and pose increased morbidity and mortality. Many ideas are available on the social media which are irrational and unscientific. This in turn would contribute to life threatening consequences.

The aftermath of unplanned pregnancies and abortions during the Covid times would cause serious psychological harm to the female gender. Lack of sympathy and attention, minimal post procedure care, increase in the cases of domestic violence and no way to vent out emotions will leave the women wounded mentally. The adolescent pregnancies and conceptions out of rape will have serious societal implications. The number of depressive disorders and psychological problems could see a sharp hike.

With the decreased supply of contraceptives there would be an increase in sexually transmitted infections. Some vulnerable groups, such as sex workers, adolescents will be exposed to risk of infections in order to protect livelihood

As the pandemic evolves and unfolds around the world, it signals an alarming view of the future and the deadly effects it would have on women health. Urgent efforts are required to secure their welfare and ensuring their reproductive rights. This demands up scaling the family planning

services with strong reforms from the policy makers. Ensuring the availability of abortifacients, removing the ban on their sale, lifting restrictions on advertising of over the counter contraceptives, improving government and private health systems to meet the demand of family planning services are a few ideas that can be considered. There is urgent need for exclusive funds for family planning services and related programs to face the challenges related to population explosion which could be expected in the near future.

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Robotic Surgery in the Covid-19 ERA

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Introduction

Ever since the coronavirus disease 2019 (COVID-19) pandemic started, guidelines have been published and widely circulated on how to maintain safety of both health professionals and patients during surgeries^[1-3]. Many major surgical societies have issued guidelines specifically addressing the place of minimal invasive surgery in these challenging times^[4-12].

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and the European Society for Gynaecological Endoscopy (ESGE) have issued extensive recommendations on the use of laparoscopy in general^[9,11]. These guidelines can be more or less extrapolated to robotic surgery as well. All surgery performed irrespective of the known or suspected severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) status of the patient, should be regarded as high risk and protection of the surgical team at the bedside should be at the highest level.

Robotic surgery helps to reduce hospital stay for patients, thus making room for COVID-19 patients and reduces the possibility of the operated patient contracting the virus as a nosocomial infection. In comparison to open or conventional laparoscopic surgery, Robotic surgery potentially reduces not only contamination of the surgical area with body fluids and surgical gasses but also the number of directly exposed medical staff.

Advantages and Disadvantages of Robotic Surgery

There is consensus that laparoscopic operations are aerosol generating procedures. The value of Robotic surgery to both the issue of gas leakage and of pulmonary stress is that CO₂ pressure can be minimized. Whereas pressure for optimal vision at conventional laparoscopy should be at between 10–15 mmHg, robotic vision remains stable and optimal up to 5 mmHg (13).

One of the potential disadvantage could be

the troublesome and time consuming pre- and postoperative decontamination of the platform — console and cart(s). On the other hand, less instruments are being used than at open surgery and these instruments will be less contaminated with blood, so easier to clean.

During a robotic procedure less operating staff is needed in the direct vicinity of the patient, as usually the scrub nurse could also assist the console surgeon, even when performing radical surgery. In any case all other staff, including trainees, should clear the theater before the intubation and operation is started.

Also, the master console can potentially be placed outside the operating room, to decrease exposure of console surgeon to aerosol generated during the procedure. While it should be made sure that the communication between patient side assistant and console surgeon is maintained, and console surgeon is able to reach patient side within seconds of any such requirement.

Finally, a great advantage of using a robotic platform is the fact that in times of extreme shortage of hospital beds hospital stay can be minimized also for urgent patients that need (radical) complex procedures that might not or less be feasible with conventional laparoscopy.

Therefore, Robotic surgery may help in minimizing the risk for contamination of healthcare providers and to make optimal use of residual resources (Table 1).

Recommendations

1. General Protection

- All patients should receive preoperative health screening including COVID screening, regardless if they are symptomatic or not.
- In case of COVID+ patient, the procedure should be postponed if not emergent.
- In case of emergency procedures, they should be performed in dedicated operating room

Table 1: Comparison of risk of transmission to healthcare workers in Robotic vs. Laparoscopy vs. Open surgery in COVID-19 pandemic

Area of Risk	Robotic Surgery	Laparoscopy	Open surgery
Smoke	Confined, filtered	Confined, filtered	Maximal exposure
Blood, body fluids	Hardly any direct exposure to blood lost during surgery	Hardly any direct exposure to blood lost during surgery	Continuous exposure to blood lost during surgery
Staff	Typically, only 1 bedside staff (surgeon away at console)	Typically, 3 bedside staff (including surgeon)	Typically, 3 bedside staff (including surgeon)
Aerosol	Intraabdominal dispersion, limited by filters or locks (no data on COVID-19 in aerosols and risk)	Intraabdominal dispersion, limited by filters or locks (no data on COVID-19 in aerosols and risk)	Less aerosol formation, unconfined dispersion, unfiltered (no data on COVID-19 in aerosols and risk)
Hospital Stay	Short	Short	Longer

(OR) following the hospital recommendation for OR staff protection.

- In case of negative COVID result, considering also the possibility of false negative, all the necessary protection tools and general recommendation to reduce COVID transmission need to be adequately followed.
- During a robotic procedure less operating staff is needed in the direct vicinity of the patient, as usually the scrub nurse could also assist the console surgeon, even when performing radical surgery. In any case all other staff, including trainees, should clear the theater before the intubation and operation is started.

2. Prevention and Management of Aerosol Dispersion

- Although previous research has shown that laparoscopy can lead to aerosolization of blood borne viruses, there is no evidence to indicate that this effect is seen with COVID-19, nor that it would be isolated to MIS procedures. Nevertheless, erring on the side of safety would warrant treating the coronavirus as exhibiting similar aerosolization properties.
- Electrosurgery units should be set to the lowest possible settings for the desired effect. Use of monopolar electrosurgery, ultrasonic dissectors, and advanced bipolar devices should be minimized, as these can lead to particle aerosolization.
- Incisions for ports should be as small as possible to allow for the passage of ports but not allow for leakage around ports.
- CO2 insufflation pressure should be kept to a minimum and an ultra-filtration (smoke evacuation system or filtration) should be used, if available.

- All pneumoperitoneum should be safely evacuated via a filtration system before closure, trocar removal, specimen extraction or conversion to open.

3. Personal Protective Equipment

- Personal protective management is essential in surgery under high risk circumstances.
- From the Chinese experience it is advised to use level III protection when the staff performs surgery for confirmed or suspected patients, because of the risk of contact with body fluids, blood or respiratory secretions^[14].
- The operating surgeon and assistant are divided between console and bedside, so they do not all need to have maximal level III protection^[8,14].
- The console surgeon may use level II protection, equivalent to the protection recommended for those working in an isolation ward area (including intensive care unit). (Table 2).

Table 2: Personal Protective Equipment for robotic surgery team

Surgical Team Member	Level of Protection	Protective Gear
Patient side Assistant	Level III	<ul style="list-style-type: none"> • Disposable surgical cap • Medical protective mask (FFP3) + goggles/visor, but preferably: full face respiratory protective device or powered air-purifying respirator • Work uniform • Disposable medical protective uniform • Disposable latex gloves
Console Surgeon	Level II	<ul style="list-style-type: none"> • Disposable surgical cap • Medical protective mask (FFP3) • Goggles/visor • Work uniform • Disposable medical protective uniform • Disposable latex gloves

4. Fecal Transmission

- It is now reported that SARS-CoV-2 is present in the stools of COVID-19 patients, but the transmission during laparoscopic procedures has not been described, and fecal-oral transmission has not been reported, although theoretically possible^[15].
- In consequence, even if clear evidence of COVID-19 virus spreading in aerosol from feces is not demonstrated yet, it is preferable to minimize bowel handling and opening in order to reduce the risk virus diffusion

5. Urinary Transmission

- Similarly, a recent study by Ling et al. reported limited persistence of SARS-CoV-2 nucleic acid in urine [16].
- This data does not clearly justify a correlation between urine spillage and virus transmission in the aerosol during robotic procedures. However, although no evidence of disease transmission through the urine is demonstrated, ureteral catheterization during the laparoscopic and robotic procedures should be executed with caution, particularly if pneumoperitoneum is already induced.

Conclusion

Offering a type of surgery which includes less direct tissue contact, which is performed in a closed system, and which is characterized by early postoperative recovery, robotic surgery might be an option with regard to patients requiring surgery in times of COVID-19, although only after thorough selection based on patient characteristics and severity of the condition that requires treatment.

Evidently, if these stringent but necessary precautions cannot all be taken, e.g., by lack of equipment it should be considered whether open surgery would be safer or whether indeed surgery would be feasible at all under the circumstances.

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Personal Protective Equipment (PPE)

Part 1: Masks

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Introduction

In the setting of health-care, Personal Protective Equipment (PPE) is the protective clothing/gear worn over the body and face by health care workers to guard against biological fluids or airborne pathogens capable of transmitting diseases. Personal Protective Equipment in the healthcare setting include surgical gowns/coveralls, aprons, masks, eyeshield/goggles, gloves, hood and shoe covers. They are designed to create a non-disease specific barrier to penetration of substances, solid, liquid, or airborne particles.

The Centers for Disease Control and Prevention (CDC) has categorized three primary routes of transmission for infectious diseases that pose a risk to health care workers:

Contact (direct and indirect)

Respiratory droplets

Airborne droplet nuclei.

Contact transmission is generally the most common and direct contact occurs when microorganisms transfer directly from one person to another. Airborne transmission occurs by dissemination of either airborne droplet nuclei or small particles in the respirable size range containing infectious agents. Droplet transmission refers to respiratory droplets generated through coughing, sneezing, or talking. SARS CoV2 has a transmission through all the three routes.

This document helps to understand the minimum standards expected of the most significant component of PPE (masks) in the setting of the current pandemic; the different designated levels of masks needed in different circumstances; and its proper recommended use and discard techniques.

Respiratory Protective Devices (RPDs)

RPDs that include face masks and respirators are an effective way of preventing transmission of air borne diseases or diseases that have droplet transmission like SARS CoV2. To get a perspective on how RPDs can

protect an individual from SARS CoV2, it is pertinent to understand its primary mode of transmission. When the infected person coughs or sneezes or for that matter even talks loudly, tiny microscopic droplets of virus laden aerosols are released into the air. Millions of virus containing droplets between the size of 0.1–900 microns (99% of which are less than 10 microns and 97% of which are less than 1 microns) are released into the air with each cough at a speed of around 40 Km/hr. The larger droplets travel up to a distance of 2 meters and fall to the ground within seconds, but the finer aerosols travel distances of up to 6 meters and remain suspended in the air for at least 10 mins in well ventilated areas, and in enclosed spaces such as flights, buses or poorly ventilated halls and rooms, it can remain suspended for several hours.^(1,2) The sneeze also produces similar sized droplets, but they are released at a faster speed of around 160 Km/hr that travel a distance of up to 6 meters and remain suspended in the air for a longer period of time. When the infected person's cough or sneeze is masked, the number of particles that travel out are reduced by 70% or more. When the non-infected person wears a mask, it provides protection based on mask characteristics and mask-hygiene that one practises.

While there are different categories of RPDs available for different circumstances, this paper will restrict itself to the ones relevant in controlling the transmission of SARS CoV2.

Types

There are broadly two kinds of respiratory protective devices against airborne diseases: Masks and Respirators. The distinction is roughly based on air seal they provide around the nose and mouths and its filtration efficiency.

1. Masks

Masks are generally designed to loosely fit around the nose and mouth. They can be broadly categorised into two types:-

a. Cloth Masks:

Are widely used by the general population as a means to reduce person to person transmission of air-borne diseases. They should ideally be 3-layered and made of cotton or muslin. The filtration efficiency depends on weave densities or thread count. (Minimum expected: 140 per inch). A recent study suggests that combinations of commonly available fabrics (cotton-silk, cotton-chiffon and cotton flannel) can provide effective filtration of 80% for particle size < 300 nanometer and 90% for particle size more than 300nm *under laboratory conditions*. However a loose fit may bring down filtration efficiency by 60%.⁽³⁾ In the actual use settings, the cloth masks provide poor filtration efficiency, poor or no fluid-barrier and poor air-seal around the nose and mouth. However there are some advantages to cloth masks. In times of shortages cloth masks can be an effective protection from SARS CoV-2 when measured against no masks. They have a low environmental impact, are easily available and are reusable after laundering.

b. Surgical masks:

The surgical mask is used to block large particles (such as droplets, splashes, sprays, or splatter) that may contain microorganisms (e.g., viruses and bacteria) from reaching the nose and mouth. They are primarily intended to protect patients or healthcare workers by minimizing exposure to large droplets of saliva and respiratory secretions. Because they generally do not form a tight seal against the face skin, surgical masks do not protect health care workers from airborne pathogens. Therefore, SMs have been relegated for protection against pathogens transmitted through fluid splash only. The protection provided by SMs against particles (0.04–1.3 μm, viral particle range) is 8–12 times less than N95 FFRs (Filtering face piece respirator).

Ideally, a surgical mask is made up three layers. The innermost layer is made up of an absorbent material that absorbs moisture from the wearer’s breath, the middle layer is made up of a melt-blown material that acts as a filter, and the outer layer is made up of material that repels liquid. The pleats are intended to increase the surface area so that the nose and the chin can also be

adequately covered. It is held in place by strings that loop around the ears or can be tied behind.

Minimum standards required of a surgical mask

There are varying levels of quality for surgical masks and respiratory protective devices and the extent of protection depends on the specification of manufacture. In the USA, the FDA sets standards and certifies these devices. As of now, there is no certifying body in India for Surgical Masks. Respiratory devices need to conform to the following quality standards as laid down by the FDA:

- **Bacterial Filtration Efficiency (BFE) > 98%**
Description: is a measure of the ability of the mask’s material to prevent the passage of aerosolized bacteria. BFE is expressed in the percentage of a known quantity that does not pass the mask material at a given aerosol flow rate. It should be >98%.
Standard: ASTM F2101-01
- **Particulate filtration efficiency for 0.1micron particle size > 95%.**
Standard: ASTM F 1215-89 or NIOSH certified
- **Differential pressure: less than 3mm.**
Description: Differential Pressure (Delta-P) is the measured pressure drop across a surgical facemask material. Delta-P determines the resistance of the surgical facemask to air flowing through the mask. Pressure drop also relates to the breathability and comfort of the surgical mask. In general, a lower Delta-P translates to increased breathability.
Standard: MIL-M-36945C 4.4.1.1.1 Method 1
- **Fluid resistance: >80mmHg**
Description: Surgical masks are tested on a pass/fail basis at three velocities corresponding to the range of human blood pressure (80, 120, 160 mm Hg). Fluid resistance may be claimed if the device passes ASTM F1862 at any levels. Surgical masks that show passing results at higher velocities are more fluid resistant.
Standard: ASTM F1862
- **Flammability: Only Class 1/2 of 4 classes that NFPA has set.**
Description: Measures the level of atmospheric oxygen required to propagate flame when ignition

is caused by an electrosurgery unit or laser. Higher levels of oxygen required for flame propagation indicate materials which are more flame resistant for electrosurgery or laser procedures.

Standard: NFPA Standard 702-1980

- *Biocompatibility of material*: Non abrasive, non toxic

Description: Tests materials for toxicity and its abrasiveness to skin against a period of contact.

Standard: ISO-10993

Intended Use of masks

Surgical masks or 3-ply cloth masks are recommended for use by patients suffering from cough, caregivers of people with cough and health care workers in situations of routine care. Surgical masks are not recommended for health care workers in situations of airborne infections or droplet infections

2. Respirators:

A respirator is a respiratory protective device designed to achieve a very close facial fit and very efficient filtration of airborne particles. Two broad classes of respirators exist based on the air supply mechanisms they have: APRs and SARs.

APRs or Air-purifying respirators do not have an air supply line and remove contaminants from the inhaled air, either by filtering out particulates (e.g., dust, mist, viral and bacterial particles) or by adsorbing gases or vapours on a sorbent (adsorbing material) in a cartridge or canister. They are tight-fitting and are available in two primary forms: half-face mask (covering the face from the nose to below the chin) full facepiece (covering the face from above the eyes to below the chin)

SARs or Supplied-air respirators supply clean air from a compressed air tank or through an air line. These are not relevant in the SARS CoV2 control and hence would not be discussed any further.

Air purifying respirators work by removing gases, vapours, aerosol droplets, solid particles, microbes or a combination of contaminants from the air with the use of filters, cartridges or canisters. They are classified into particulate, gas or chemical respirators, based on what the primary contaminant filtered is. They could be named based on whether

they cover full face or half face, whether they are disposable or reusable and whether they are powered or unpowered. Powered air-purifying respirators are also known as PAPRs. In the context of SARS-CoV-2, particulate respirators are recommended.

a. Disposable Air purifying respirator:

Also known as *Filtering face piece mask (FPP) or Filtering face piece respirator (FFR) or the Disposable filtering half-facepiece respirators (DFHFR)*. are air-purifying respirators that efficiently filter particles of size most likely to be in the viral/ bacterial range. They usually cover half the face including the nose mouth and chin. They are widely used and accepted by workers in various industries including the health care setting and the general population. This is because DFHFRs are available in multiple sizes to fit a range of faces, are easy to maintain, offer little hindrance to wearers, and have the highest rating and evaluation in weight and convenience⁽⁴⁾.

The filter of the particulate respirator is made up of millions of microfibers of polypropylene layered on top of each other that have been permanently electrostatically charged. The electrical charge is necessary to retain its ability to filter microorganisms or microparticles. Most of these are tested for their filtration efficiency against particle sizes of more than 0.1 microns. Even though the corona virus is less than 0.14 microns in size, it is incapable of airborne transmission unless suspended in a droplet of size 0.3-5 microns. For protection against virus suspended in droplet sizes more than 5 microns, the material has high level fluid resistance properties in accordance with the standards set by ANSI/AAMI PB70: 12. Thus these respirators provide effective protection against SAR CoV2 transmission.

The US National Institute for Occupational Safety and Health (NIOSH) classifies particulate filtering facepiece respirators (FFRs) into nine categories (N95, N99, N100, P95, P99, P100, R95, R99, and R100). N (not resistant to oil) means that the respirators cannot be used in an oil droplet environment; R (somewhat resistant to oil) and P (strongly resistant to oil) mean that this respirator can be used for protection

against non-oily and oily aerosols. Numerical designations 95, 99, and 100 show the filter’s minimum filtration efficiency at 95%, 99%, and 99.97%, respectively.⁽⁵⁾

Among DFHFRs, *NIOSH-approved N95* filtering face-piece respirators or higher are recommended for healthcare workers against airborne infectious diseases such as Ebola or SARS CoV2⁽⁶⁾.



Image 1: Particulate air purifying respirators. a) N-95 respirator: Standard design b) N-95 respirator: Duck bill design

The European Standard (EN 149:2001) classifies FFRs into three classes: FFP1, FFP2, and FFP3 with corresponding minimum filtration efficiencies of 80%, 94%, and 99%. Therefore, FFP2 respirators are approximately equivalent to N95 FFRs, making them recommended for use in the prevention of airborne infectious diseases in the US and some other countries. However, because *FFP3 respirators* provide the highest level of protection, they are the only FFP class acceptable to the Health and Safety Executive (HSE) for protection against infectious aerosols in healthcare settings in the UK⁽⁷⁾

b. Non-disposable full face-piece or half-facepiece air purifying respirator:

Non-disposable air-purifying respirators are made of elastomeric substances that can be cleaned as per the manufacturer's instructions and reused. (Image 2). The respirator includes a facepiece or mask (full face-piece or half face-piece), and a filter/cartridge. The full-face-piece provides eye-protection too. The cartridge may have a particulate filter (to remove bacteria or virus), charcoal (to remove certain chemicals), both, or other parts. The cartridge has to be replaced after approximately 40 hours of use or as per manufacturer's instructions. Straps secure the facepiece to the head. In general, the non-disposable full-facepiece respirator provides a

better air seal than the disposable respirators like N-95. A fitting test is nevertheless required in order for it to provide a leakproof air-seal. When the user inhales, air is pulled through the filter and exhaled through a valve.

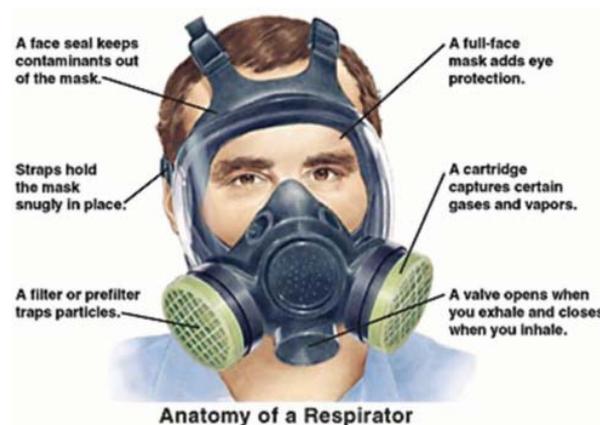


Image 2: Full face piece non disposable respirator with cartridges

c. Powered air purifying respirators (PAPR)

A PAPR is an air-purifying respirator that uses a blower to force air through filter cartridges or canisters and into the breathing zone of the wearer. This process creates an air flow inside either a tight-fitting facepiece or loose-fitting hood or helmet, providing a higher assigned protection factor (APF) than the reusable N95 FFRs. A PAPR can be used for protection during healthcare procedures in which HCP are exposed to greater risks of aerosolized pathogens causing acute respiratory infections. A PAPR may have a tight-fitting half or full facepiece or a loose-fitting facepiece, hood, or helmet. It has an OSHA APF of at least 25 for loose-fitting hoods and helmets, 50 for tight-fitting half masks, and 1,000 for full facepiece types and some loose-fitting hoods and helmets where the manufacturer's testing has demonstrated an APF of 1,000.

PAPRs with loose-fitting headgear can be worn with a limited amount of facial hair. Some PAPRs have disposable, loose-fitting headgear and patients can see the face of the HCP, providing for better interpersonal communication. Other PAPR components can be cleaned, disinfected, re-used, and shared.⁽⁸⁾. Because of higher user comfort associated with PAPR, they are used in the settings of air borne diseases with high aerosol generation as in

COVID OTs or COVID ICUs and where work hours are expected to be long.



Image 3: Powered air purifying respirator

Other features to consider in a respirator

Air seal

The respirators need to have a good air-sealed fit because air seal leakages in these masks could hamper the stated level of protection. A study examining protection against particle sizes 0.093–1.61 μ m representing viral and bacterial particles found that particle penetration through face seal leaks is greater than that through filter material (for surgical masks \sim 4 to 8 times greater, and FFP respirators were 1.5–6.7 times greater⁽⁹⁾).

Exhalation valve

Wearing a respirator for an extended period of time can become uncomfortable due to breathing resistance and buildup of heat and humidity inside the mask. To alleviate these issues and improve comfort, some masks are equipped with an exhalation valve. This valve allows the exhaled air to escape freely from the mask, avoiding condensation and preventing the filter from becoming less permeable and unpleasant to wear. A mask with an exhalation valve protects the wearer just as well as a mask without a valve. However, it is important to note that an exhalation valve allows unfiltered air to freely exit the mask. Therefore, in the case of diseases with airborne or respiratory droplet transmission (like SARS CoV2) a mask with a valve will not protect other people and the environment from the pathogens potentially exhaled by the person wearing such a mask. In these situations, masks without exhalation valves are preferable in order to protect others. Additionally, the exhalation valve might malfunction, which could increase the risk of infiltration of contaminants or toxic dust.

Wearing and removing an N-95 and mask hygiene

It is important to know how to properly wear or remove masks/respirators because a breach in protocol could counter-intuitively increase one's risk of infection.

1. Respirators must be put on and taken off in an area *outside* of the infected area. Putting a respirator on or taking it off even for a few seconds in an infected area like a COVID ward or a COVID ICU or OT can expose the wearer to significant levels of infections.
2. Perform hand hygiene before donning the mask. Avoid touching the interior of the mask.
3. Fit of the mask should be checked after wearing it. The metallic tab allows adjustment to fit the nasal bridge. Ensuring there is no air passage through the sides on blowing out and that the mask compresses inside on blowing in. Readjust seal if leakages observed.
4. Beards are not acceptable for N-95, Use hooded masks like PAPR in such situation.
5. The outer surface should not be touched once the mask is worn. If needs to be touched for comfort or adjustment, hand hygiene should be practiced with soap and water or an alcohol-based hand sanitizer before and after.
6. N-95s soiled with blood, respiratory or mucus secretions should be discarded. They should never be reused.
7. Consider use of a cleanable face shield over an N95 respirator to reduce surface contamination.
8. Removal should be done without touching the outer surface. First, tilt your head forward. Then, use one hand to grab the bottom strap in the middle, pull to the sides, then over your head. Next, use the other hand to grab the upper strap, pull to the sides, then over your head. Keep tension on the upper strap as you remove it, which will let the mask fall forward. Dispose of the mask. Perform hand hygiene
9. Reuse is permitted in conditions of shortages. Four days interval needed for reuse. Till then it needs to be kept in a clean paper bag with a mark mentioning when it was last used.
10. In case of sterilisation, methods should be such that the filtration efficiency and fit of the mask

should not be altered by sterilisation method. Plasma sterilisation is the most effective way to sterilise these masks.

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Journal Scan

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Characteristics and outcomes of pregnant women hospitalised with confirmed SARS-CoV-2 infection in the UK: a national cohort study using the UK Obstetric Surveillance System (UKOSS)

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Abstract

Objective: To describe a national cohort of pregnant women hospitalised with SARS-CoV-2 infection in the UK, identify factors associated with infection and describe outcomes, including transmission of infection, for mother and infant.

Design: Prospective national population-based cohort study using the UK Obstetric Surveillance System (UKOSS).

Setting: All 194 obstetric units in the UK

Participants: 427 pregnant women admitted to hospital with confirmed Sars-CoV-2 infection between 01/03/2020 and 14/04/2020. 694 comparison women who gave birth between 01/11/2017 and 31/10/2018.

Main outcome measures: Incidence of maternal hospitalisation, infant infection. Rates of maternal death, level 3 critical care unit admission, preterm birth, stillbirth, early neonatal death, perinatal death; odds ratios for infected versus comparison women.

Results:

Estimated incidence of hospitalisation with confirmed SARS-CoV-2 in pregnancy 4.9 per 1000 maternities (95%CI 4.5-5.4).

Median gestation at symptom onset was 34 weeks (IQR 29-38).

Risk factors: Black or other minority ethnicity (aOR 4.49, 95%CI 3.37-6.00), older maternal age (aOR 1.35, 95%CI 1.01-1.81 comparing women aged 35+ with those aged 30-34), overweight and obesity (aORs 1.91, 95%CI 1.37-2.68 and 2.20, 95%CI 1.56-3.10 respectively compared to women with a BMI<25kg/m²) and pre-existing comorbidities (aOR 1.52, 95%CI 1.12-2.06) were associated with admission with SARS-CoV-2 during pregnancy.

Outcomes: 247 women (58%) gave birth or had a pregnancy loss; 180 (73%) gave birth at term. 40 (9%) hospitalised women required respiratory support. Twelve infants (5%) tested positive for SARS-CoV-2 RNA, six of these infants within the first 12 hours after birth.

Conclusions: The majority of pregnant women hospitalised with SARS-CoV-2 were in the late second or third trimester, supporting guidance for continued social distancing measures in later pregnancy. *Most had good outcomes and transmission of SARS-CoV-2 to infants was uncommon.* The strong association between admission with infection and black or minority ethnicity requires urgent investigation and explanation.

Study Registration: ISRCTN 400922

Commentary:

This paper is in the preprint stage and the abstract has been extracted from Med Rxiv; the BMJ Yale preprint server for health sciences.

It is a large population-based dataset on COVID-19 in pregnancy. Earlier inferences on pregnancy with COVID-19 have been drawn from smaller but significant datasets from China (n=116, Yan et al, AJOG, 2020) and New York (n=43, Breslin N et al, AJOG 2020). This work confirms reassuring outcomes for pregnant women suffering from COVID-19 and infants born to them. For the six infants testing positive for COVID-19 RNA within 12 hours of birth (2%), it remains to be seen if this was through vertical transmission or a result of contamination through birth canal. An IgM testing of infants (not done here) could have confirmed transplacental transmission. Also, the policy of immediate rooming in of the baby with mother was followed, so a probability of contamination with maternal Viral RNA cannot be ruled out.

Events held

1. On 31st May 2020, a webinar on - “Challenges in management of Covid positive and negative pregnant women during Covid Pandemic” organized by Safe Motherhood Committee AOGD and NARCHI Delhi.
2. On 4th June 2020 - a webinar on “Perinatology” by ISOPARB, GOGS and SAATH SAATH program of IAP/ FOGSI in association with GSK.
3. On 5th June 2020, Pictures and Video Competition on occasion of World Environment Day with the themes “How environment has reclaimed following lockdown” and “Pollution/Toxins and impact on fetus” organized by Dr. Ashok Kumar and Dr. Archana Verma.
4. On 6th June 2020, a webinar on “AUB- A Rollercoaster at Midlife” panel discussion moderated by Dr. Kiran Guleria and Dr. Sunita Kumar under the aegis of AOGD.
5. On 6th June 2020, a webinar on IUI organized by Endocrinology Committee AOGD & ICOG.
6. On 7th June 2020, virtual CME on “Current Updates on AUB- SAVE THE UTERUS” held under the aegis of AOGD by Dr. Manju Khemani and Dr. Madhu Goel.
7. On 10th June 2020, a webinar on “Management of Preterm labour” and “Role of Vit. D in Pregnancy” by Dr. Sujata Agarwal and Dr. Shivani Sachdev Gour under the aegis of AOGD.

Forthcoming Events

1. On 13th June 2020, a webinar on “Placenta Accreta Syndrome” under the aegis of AOGD by Dr. Meena Samant, Dr. A.G. Radhika and Dr. Sharmistha Garg.
2. On 14th, 21st, 28th June 2020, 5th July , 12th July , 19th July 2020, Sunday webinar series, June-July under ISCCP & FOGSI Oncology Committee in association with Oncology Committee of AOGD on updating skills in Cervical Cancer Prevention.
3. On 16th June 2020, a webinar on “Ovarian Cancer” under the aegis of AOGD.
4. On 17th June 2020, a webinar on “Vaginal Discharge- A silent suffering” under the aegis of AOGD.
5. On 20th June 2020, E-CME on “Comprehensive Abortion Care” under the aegis of FOGSI MTP Committee 2020 and AOGD.
6. On 23rd June 2020, AOGD Virtual Executive Committee Meeting at 04:00-05:00 pm.
7. On 26th June 2020, AOGD Virtual Monthly Clinical Meeting and GBM between 04:00-06:00 p.m. Organised by Safdarjung Hospital, New Delhi.
8. On 29th June 2020, a webinar on “Capsule on Nutrition and Physiotherapy for antenatal patients” under the aegis of AOGD.
9. On 6th July 2020, a webinar on “Question and Answer sessions for antenatal patients” under the aegis of AOGD.
10. On 31st July 2020, AOGD Virtual Monthly Clinical Meeting will be organised by AIIMS, New Delhi at 04:00-05:00 pm.

Clinical Proceedings of AOGD Clinical Meeting held at BL Kapoor Hospital, New Delhi on 29th May, 2020

Sentinel Lymph Node (SLN) Mapping in Early Endometrial Carcinoma

Dinesh Kansal, Pooja Gupta

Sentinel lymph node is the first node receiving lymphatic drainage from the primary tumour. Lymph flow is uni-directional hence SLN is more likely to detect micro-metastasis. It can replace complete lymphadenectomy for staging, which has been the gold standard in detecting metastatic disease for endometrial cancer.

68 year old menopausal patient complained of bleeding per vaginum off and on for 2 months. She was diabetic, hypertensive, obese and hypothyroid with blood group O negative. MRI revealed 15 mm thick endometrium with a suspicious area present at uterine fundus. Hysteroscopy guided biopsy and curettage showed well differentiated endometrioid carcinoma, grade 1. Total laparoscopic hysterectomy, BSO with sentinel lymph node mapping was done. Total duration of surgery was 2 hours and blood loss 20 ml only. The nodes were subjected to ultra-staging. The technique involves multiple thin sections with Immunohistochemistry for Cytokeratin 19. Final diagnosis was FIGO stage 1A, grade 2 Endometrioid cancer. Thus, this patient with low risk endometrial cancer was spared the ordeal of complete pelvic and para-aortic lymphadenectomy, a prolonged surgery, blood transfusions and ICU stay. She was mobilized within 12 hours and was ready for discharge after 24 hours.

For SLN mapping, cervical injection of blue dye or radioactive tracer- ^{99m}Tc with gamma camera or ICG with Near infrared (NIR) imaging is used. The other sites for injection of tracers are hysteroscopic sub-endometrial or intra-operative myometrial injection. Newer detection techniques include Carbon Nano particles or Nucleic acid amplification (OSNA) procedure. Most of the patients of endometrial carcinoma are coming for medical treatment with early disease. For low risk endometrial carcinomas, PLND and PALND is probably over treatment. The sentinel lymph

node mapped patients had twice as many lymph node metastases as the non-mapped group (30.3% versus 14.7%; $P < 0.001$) as found by Holloway RW et al. Thus, 18% and 20% of patients were upstaged by SLN mapping. Khoury-Collado et al and Kumar et al had similar results. Fires study, a prospective multicentric study with 385 patients showed negative predictability in 99.6% and positive sentinel node detection in 97%. SLN can conveniently be done by minimally invasive surgery- Robotic and Laparoscopic. Healing is rapid and patient is ready for adjuvant treatment earlier than laparotomy. The radicality of complete lymphadenectomy may do more harm than benefit to patient in the form of complications like blood vessels & nerve injury, prolonged convalescence, mental stress, debilitating lymphedema and lymphocele seen in 5 to 38% of the patients. Ibrahim et al found SLN mapping to be more cost effective due to shorter hospital stay and saving on patient's work hours. SLN mapping allows upstaging in low or intermediate risk ECs in whom adjuvant therapy would be omitted if lymphadenectomy was not done. Sentinel lymph node mapping is the standard practice for Ca Breast, malignant melanoma and Ca vulva. SLN is a modern surgical strategy that may resolve the debate within the gynaecological cancer community on whether or not to carry out pelvic node dissection in endometrial cancer.

Hemoperitoneum Due to Traumatic Rupture of Fibroid – A Rare Complication

Laxmi Mantri, Poonam Khera, Jamsheed Ahmad

Fibroid uterus is the most common benign pelvic tumor in the reproductive age group of females. It is usually slow growing. The common symptoms are menstrual abnormalities, pelvic pressure symptoms, and symptoms related to reproductive dysfunction.

Acute abdomen due to fibroid uterus is rare. Acute abdomen can be because of torsion of subserosal fibroid or myomatous uterus or red degeneration. Abdominal trauma leading to hemoperitoneum

is mainly due to rupture of liver or spleen or vascular injury. Traumatic rupture of fibroid leading to hemoperitoneum is very rare. Most complicated fibroids are usually large subserosal and pedunculated. Bleeding from fibroid may be due to rupture of dilated veins, avulsion, torsion, or rupture of the degenerated fibroid.

Our case dealt with a 38 years old nullipara patient who was a known case of multiple fibroids who presented to BLK casualty with H/O roadside fall and acute abdomen. She had generalized tenderness all over the abdomen with radiating pain to the right shoulder. USG and CECT showed multiple fibroids uterus with haemoperitoneum. Patient was counselled and proper consent was taken. Patient was taken up for emergency laparotomy after arranging adequate blood. Moderate hemoperitoneum was there. Uterus was about 24 week size with multiple fibroids ranging from 2-10 cm. One large subserosal fibroid was soft and had a rupture area of about 2 cm with active bleed. Myomectomy was done. Total 14 fibroids were removed. Proper hemostasis was achieved, uterine shape was reconstructed and thorough suction and irrigation was done. Majority of patients require hysterectomy but in our case, myomectomy was sufficient. Patient stood operation well.

The reported cases of hemoperitoneum due to fibroid in India were caused by either avulsion of fibroid, spontaneous rupture, or tear of subserosal vein. To best of our knowledge, this is the first case of traumatic rupture of the fibroid leading to hemoperitoneum in India.

We should have a high index of suspicion if a patient who is a known case of multiple large fibroids presents with acute abdomen and shock. Prompt surgical treatment is life saving.

Hypertriglyceridemia Induced Acute Pancreatitis in Pregnancy

Pooja Gupta, Dinesh Kansal

Hypertriglyceridemia induced acute pancreatitis is a rare condition with incidence of 4 %. The triglyceride level may increase two to four times the normal level during pregnancy but it rarely exceeds 300 mg/dl in pregnancy.

A 26yr female G3A2 with POG 27 weeks 3 days POG presented to the emergency department of

BLK hospital with pain abdomen for last 3 days, which was radiating to back. Her vitals were stable. On Per abdomen examination uterus was 28 weeks size with mild tenderness in the upper abdomen. Patient was investigated. Her blood sample was taken and found to be milky pinky and lipemic in appearance, so lipid profile was also done along with other investigations. Her S. Amylase & lipase were raised. To our surprise, her Triglycerides(TG) (4998mg/dl) & Total Cholesterol (1223mg/dl) were too high. Her blood sugar was 173mg/dl and urine ketones was 3(+).

On the basis of above, diagnosis of "G3A2 with 27 weeks 3 days Pregnancy with Hypertriglyceridemia induced acute pancreatitis with GDM with Ketoacidosis" was made. Patient was managed via a multidisciplinary team approach. She was managed with insulin, heparin and lipid lowering drugs. Four cycles of Plasma Apheresis were done. She improved gradually and was discharged after 12 days on lipid lowering drugs (Finofibrate) and her TG was 534mg/dl at the time of discharge. Patient delivered a term healthy baby at her hometown, with no intrapartum or post-partum complications. Management of gestational hypertriglyceridemia is associated with many clinical challenges. Multidisciplinary care and careful dietary planning are crucial to optimize maternal and perinatal outcomes. Future studies are required to delineate the optimal timing for induction and delivery. Strong consideration should be given towards induction once fetal maturity is established, especially in women whom triglyceride levels show a steep upward trend in the third trimester.

A Rare Case of Multiple Parasitic Fibroids

Poonam Khara, Kanika Garg, Laxmi Mantri

Uterine leiomyomas are the most common benign tumors of the uterus in reproductive age group. Parasitic leiomyomas are rare type of leiomyomas with no parasitic involvement and uterine attachment. They are classified further as primary spontaneous and secondary parasitic myomas. Only few cases of primary parasitic leiomyomas have been reported in the literature till date¹. However, incidence of secondary parasitic leiomyomas is rising secondary to laparoscopic myomectomy and morcellation.

Case Report:

We report a case of multiple iatrogenic parasitic fibroids which presented as bowel obstruction. A 35 yrs old unmarried female came with complaints of pain in abdomen, vomiting and generalized weakness since 3 days. CT scan abdomen revealed multiple solid, non necrotic intraperitoneal masses with small bowel obstruction. Tru-cut biopsy was done to confirm the diagnosis from intraperitoneal masses, which was reported as leiomyoma. When the patient was counseled about the diagnosis and treatment, she gave the history of laparoscopic myomectomy followed by morcellation 7 years back . She intentionally did not reveal the history previously to hide from the family.

Patient was taken up for exploratory laparotomy. Intraoperatively, multiple parasitic fibroids (total 13 in number) were noted in relation with bowel and mesentery of variable sizes from 1 cm to 8 cm. There was a fibrous band from the parietal wall to the jejunum. Careful excision of the fibrous bands and removal of parasitic fibroids was done with the help of gastrointestinal surgeon. Whole gut loops were examined to exclude any small fibroid. Also, uterus was enlarged to 16-18 weeks due to multiple intramural and subserosal fibroids. Eleven fibroids of sizes varying from 1 to 6 cm were removed from the uterus.

The post-operative recovery was good and she was discharged on third post-operative day.

Discussion:

Parasitic leiomyomas are very rare extrauterine tumors which can create clinical dilemma due to atypical clinical presentation and unusual location. The surgeons should be aware of the potential for iatrogenic parasitic myoma formation, their likely increasing frequency and intraoperative precautions to minimize their occurrence.

A large retrospective study was done by Gaspare et al to report the development of the parasitic myomas after the use of a morcellator over 3 years study period in a tertiary care centre. Out of 423 women, in whom electric morcellator was used, four cases were identified to have parasitic fibroids

with the prevalence of 0.9 percent. This study concluded that laparoscopic myomectomy with the use of a morcellator is associated with an increased risk of developing parasitic fibroids. Therefore, a thorough inspection and washing of abdominopelvic cavity should be performed to prevent this rare complication.

Due to rarity of parasitic myomas, atypical presentation and unusual location, they give big challenge to the gynecologists to reach correct diagnosed pre-operatively. Thus, Parasitic myomas should always be included in differential diagnosis of various abdominopelvic masses in females especially with atypical presentation and history of laparoscopic myomectomy with morcellation.



References:

1. Mandal D, Dattaray C, ROY S. Spontaneous parasitic leiomyomas. A rare clinical experience. *J South Asian Feder Obs Gynae* 2013;5(2):85-6
2. Gaspare C, Roberta G, Gloria C, Edgardo S. Parasitic myomas after laparoscopic surgery: an emerging complication in the use of morcellator? Description of four cases. *Ferti l Steril. American society of reproductive medicine.* 2011;96(2):90-6

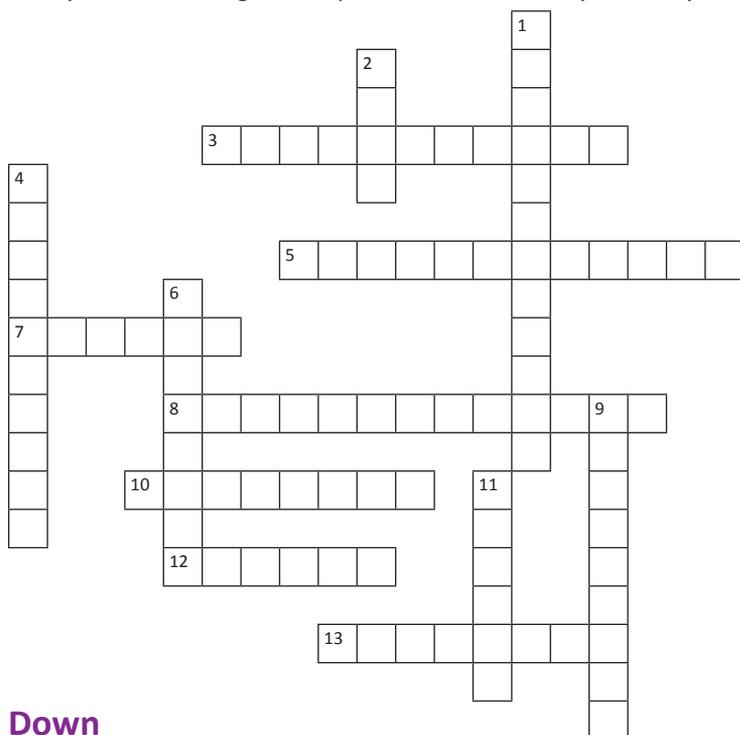
Cross Word Puzzle

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CROSSWORD

Test your knowledge of Reproductive Anatomy and Physiology



Across

- 3. Fixation of uterus (11)
- 5. Ligament used for uterine suspension (11)
- 7. Wrigley’s forceps is a category of ——— forceps (6)
- 8. Removal of cervix and upper part of vagina (13)
- 10. Common manoeuvres used to systematically determine fetal position in uterus (7)
- 12. Hormonal Intrauterine device (6)
- 13. A surgery involving creation of neovagina and lining it with graft. (3,5)

Down

- 1. Surgery done for imperforate hymen (12)
- 2. Loop electrosurgical excision procedure (4)
- 4. Visualization of cervix under magnification (10)
- 6. Surgery for cervical cancer (8)
- 9. A synthetic tape used in sling procedures for uterine prolapse (9)
- 11. Obstetric manoeuvre used for disengaging impacted shoulder (6)

PICTORIAL QUIZ



- 1. Identify
- 2. What is the incidence of this anomaly?
- 3. What are the possible symptoms?

Answer: May 2020 Issue Crossword

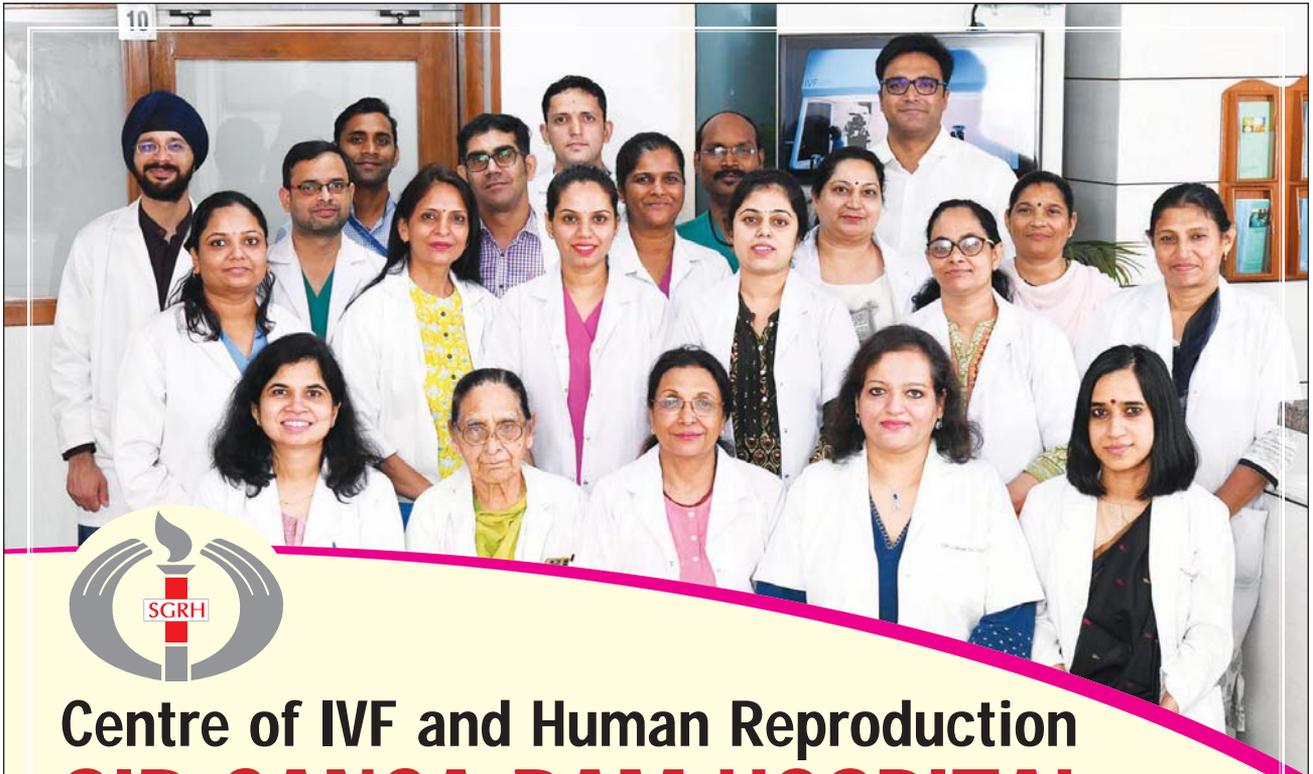
Across:

- 1. Decidua Vera
- 2. Glycine
- 3. Glans
- 4. Uterine NK cell
- 5. Leydig
- 6. Intron
- 7. Theca Lutein

Down:

- 1. Gastrulation
- 2. Cumulus
- 3. Acne
- 4. Elagolix
- 5. De graaf
- 6. Arcuate
- 7. AIS
- 8. Estrone

Whatsapp your answers to **9810126985**.
Names of first three correct entries will be mentioned in the next issue



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