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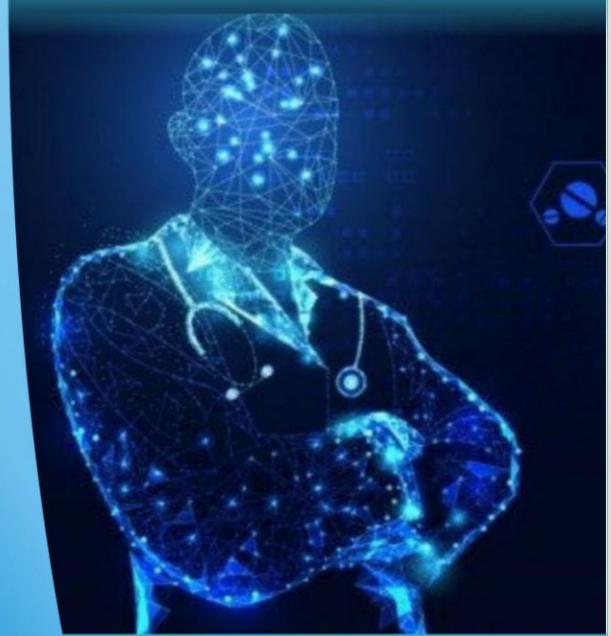

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Contents

EDITORIAL

A Life Giver and Life Enhancing Transplant – Uterus Transplant

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Key words: Organ Transplantation ,Utx , deceased donor (DD

Organ transplantation is a medical advancement saving and improving quality of life of individuals. It is a boon for persons with end-organ failure.

The process of organ transplant is complicated and it's a patience testing process for recipient, his or her family members and the medical team involved in it.

It is a remarkable achievement in modern medicine which offers a second chance of life.[1]

For uterus transplantation (Utx) it is said that it is a life giver or a life-enhancing transplant.

Definition of organ transplant is, moving of organ from one body to another body for the purpose of replacing recipients damaged or failing organ with working one from the donor, where the donor can be living or deceased.

As we all well worse with organ transplantation history, enumerate first living donor transplant was a kidney transplant done way long back in 1954 at Boston, Massachusetts USA.

Table 1 shows a list of transplants that took place according to organ and year of its occurrence.

In a female reproductive system, transplants have different importance, as failure of these organs is not end organ failure which will lead to danger to life. Definitely, it is going to fulfill patient's right to achieve gestation parenthood (become mother).

In a female reproductive system, transplants involved are of ovary and uterus. Noticeable and proud event is that first successful ovarian transplant took place in 2002 in Mumbai, Maharashtra and first uterine transplant took place in India at Pune, Galaxy center with followed by successful live birth 1st time in India.

Unlike traditional solid organ transplantation, Utx is not a lifesaving but it is a LIFE GIVING. In utx costs, ethical, and psychological issues are inevitable. Utx is a vascular composite allograft means it can be done in genetically non-identical members of the same species.

Utx represents a significant step forward in addressing infertility in cases of Absolute Uterine Factor Infertility (AUFI). AUFI affects 1:500 women of fertile age. It can be either uterine absence or uterine defect. In AUFI before Utx, the only option for treatment of infertility was surrogacy or adoption. With help of Utx AUFI patients gets chance to have .....a gestation.

HISTORY

All over the world more than 80 Utx procedures have been performed in almost in 20 centers.

More than 40 live births had been achieved by 2022. In the field of Utx animal research is going on from 1999, which was done on mouse, rat, sheep, pig, and non-human primates. In human first live donor (LD) Utx took place in 2000, it took almost 15 years to have a successful first live birth after Utx. At institute of Clinical Science Sahlgrenska Academy at University of Gothenburg, Sweden first live birth after Utx took place. A 35-year-old woman with congenital absence uterus (atypical Rokitansky syndrome) received uterus from LD of 61 years old two parous women in 2013 and who delivered at 31 weeks 5 days gestation a male baby weighing 1,775 g, in 2014.

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Table 1: Organ transplant history

Type of transplant	Year of transplant
Kidney transplant	1954
pancreas transplant	1966
liver transplant	1967
Pancreas and heart transplant	1968
Heart and lung transplant	1981
Single lung transplant	1983
Double lung transplant	1986
Intestinal transplant	1987
Split liver transplant	1988
Living donor liver transplant	1989
Living donor lung transplant	1990
First uterus transplant	2000
First successful ovarian transplant	2002
First uterus transplant with successful live birth	2015

First deceased donor (DD) Utx took place in 2017 and the first live birth from DD Utx took place in 2017.

In May 2017 a successful uterine transplant performed and in October 2018 first live female baby born as the first of Asia's, the first of India, and 12th of world's successful live birth after Utx. This took place in Galaxy center hospital, Pune, Maharashtra and was performed by Dr Shailesh Puntambekar.

As research and technology advances technique of Utx also evolved and the first live birth took place on 25 May 2023 after both donor and recipient surgery took place by Robotic assistance again at Institute of Clinical Science Sahlgrenska Academy at University of Gothenburg, Sweden.[1]

INDICATION

Recipient

1. Mayer-Rokitansky-ku: ster-Hauser syndrome (MRKH): MRKH has incidence of 1 in 5,000 women. Congenital absence of uterus is a manifestation of this syndrome. They have normally functioning ovaries with variable degree of short vagina. Women with atypical MRKH present with additional renal abnormality.
2. Asherman syndrome: Uterus present with dysfunctional endometrium due to adhesions formation affects 1.5% of reproductive age patients. Utx should be considered in severe cases where all other treatment options are exhausted.
3. Hysterectomy: Hysterectomy in reproductive age was included, hysterectomy performed for benign gynecological disorders and for severe postpartum hemorrhage. Hysterectomy due to gynecological cancer requires a special caution before giving consideration for Utx.
4. Other factors: Complex congenital uterine anomalies, radiotherapy damage.

At present Utx can be performed in a person who is genetically XX. In Androgen insensitivity syndrome person and in a person who have undergone gender reassignment role of Utx is uncertain till date due to ethical considerations.[2]

Other factors needed to be evaluated with main indication for Utx.

a. Recipient age should be in between 18 and 45 years of age
b. Healthy organs of other systems
c. No presence of major trauma or surgery for negative effect on outcome of Utx
d. Psychological stability
e. Healthy person with no limitation to prescribe immunosuppression agents with informed consent about adverse effect of these drugs
f. Recipient should be aware about long-term post-operative rehabilitation.

Potential Donor

About 80% of Utx have been performed from multiparous living donors.

LD

Planning of elective surgery is easier than in DD where on-call and transport arrangements needed to be done.

LD needs to undergo many investigations to prevent microbiological transmission of infections.

Investigations include Human immunodeficiency virus, Hepatitis B and C, cytomegalovirus, Epstein Barr virus, syphilis, toxoplasma, and human T cell lymphotropic virus. Added advantage of living donor is that time availability to do cervical smear and human palloma virus (HPV) testing to rule out precancerous and cancerous lesions of cervix. Chlamydia, gonorrhea and trichomonas infection ruled out by vaginal secretion culture.

Transvaginal sonography (TVS) needed to be done to rule out structural abnormalities. Magnetic resonance imaging or computed tomography angiography is done to provide information of vessel morphology and caliber and patency of vessels.

Most of the living donors were related to the recipients. Use of 1sto relatives provides immunological benefits. Age of donor at donation have impact on success of transplant as age increases chances of atherosclerotic changes in pelvic vessels increases and may lead to an organ of insufficiency quality for embryo implantation. Increasing age might cause

arterial inflammation which can cause post-transplant graft vasculopathy.[2]

DD

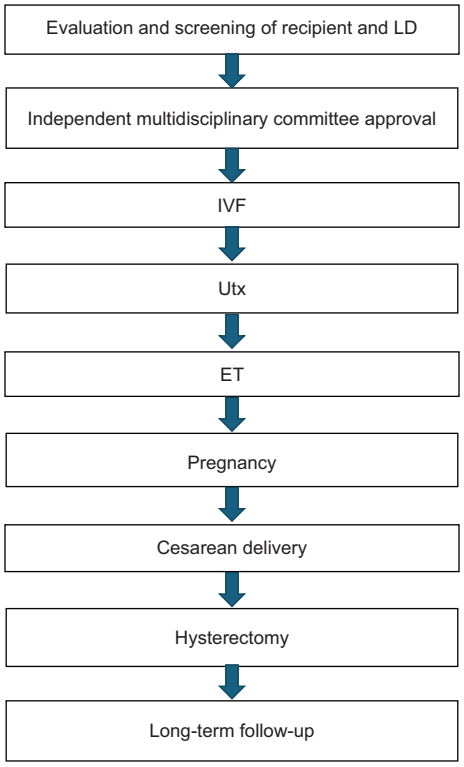
Use of DD allows more radical dissection, enabling larger caliber vessels to reduce the risk of graft thrombosis. It is advocated to retrieval of uterus before retrieval of other lifesaving organs for donation. DD also needs to screen for sexual transmitted disease screen and cervical cytology and HPV testing. TVS is mandatory to rule out presence of uterine structural anomalies. Risk of inflammation increases, which may influence organ quality due to brain dead state in DD.

Even though uterine graft tolerance for cold ischemia is up to 24 h still increase in transplant time is potential for ischemia – reperfusion injury, which may increase risk of acute and chronic rejection of graft.

In decease donors there is an increase risk of fungal infection.[2]

CLINICAL FLOW OF HUMAN UTERUS TRANSPLANT

Utx transplant is different from other transplants as in Utx, there is a involvement of Recipient, Donor, partner of recipient, and possible future child.



Flowchart of uterus transplantation in human. LD: Live donor, DD: Deceased donor, ET: Embryo transfer, UTx: Uterus transplantation, IVF: *In vitro* fertilization

SURGERY TECHNIQUE FOR LD HYSTERECTOMY

Surgery in donor can be performed by laparotomy or laparoscopy, laparoscopic-assisted robotic surgery.

First, transection of round ligament and opening of vesicovaginal spaces is done. Dissection of uterine tunnel and the distal aspect of ureter is a crucial step (Area from tunnel outlet to bladder). In uterine tunnel, there will be overriding of uterine artery and under-riding or overriding of deep uterine vein [Figures 1 and 2]. Tunnel is covered by connective tissue by several small arteries and veins. These need to be dissected. Ureter is fully freed. Large vessels are fully attached to ureter and cervix. One or two deep uterine veins are used in graft. Both sides vascular pedicle, uterine artery, and deep uterine vein are dissected with – ligation and transection of branches. In cases with thin uterine vein with insufficient venous outflow utero ovarian vein is dissected. Before going further, the oviduct, the utero ovarian ligament, and Sacro – uterine ligament are divided. The vagina is transected 2 cm below cervix. Vascular pedicles are clamped and transected with back-table flushing and cooling.

SURGICAL TECHNIQUE FOR TRANSPLANT IN RECIPIENT

Surgery time is less, compared to in donor. It is 2–6 h in 73% of cases. First clearance of vaginal vault from the bladder and external iliac vessels is done. In women with MRKH, the rudimentary uterus in midline is cleaved to vault level. The graft is lifted into pelvis to perform end-to-end anastomosis of uterine vessels to external iliac vessels with 8–0 polypropylene. The vault is opened and vaginal-vaginal anastomosis is done. [Figure 2] Fixative sutures connect round and uterosacral ligament.

The presence of good pulses distal to arterial anastomosis site and the uterine tissue turns pale to reddish which is a sign of peripheral tissues perfusion.

IMMUNOSUPPRESSIVE PROTOCOL

For all solid organs transplant, it is essential and mandatory the burden of immunosuppressive medication. Aim is to keep it in small doses and avoidance of steroids wherever possible. In uterine transplantation, tacrolimus is a preferred agent. Initially only mycophenolate mofetil is preferred to use. mycophenolate mofetil can be used along with prednisolone. Mycophenolate mofetil is later withdrawn in anticipation of embryo transfer (ET) as it is teratogenic in nature. It is usually replaced with azathioprine. Alternative regimen used for maintenance is a combination of tacrolimus and azathioprine

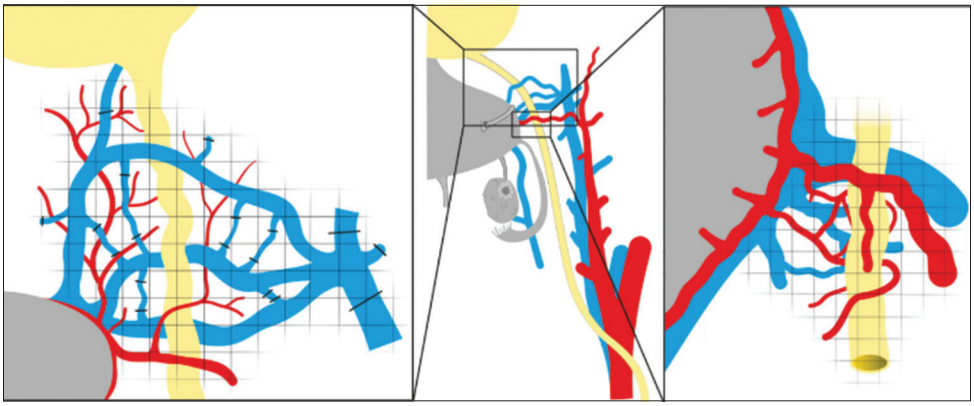


Figure 1: Anatomy of donor right pelvic side middle large square shown on the left side shows overriding and under riding of uterine veins on ureter and small square shown on the right side shows overriding of uterine artery over ureter. (Ureteric tunnel). Uterine vein blue in color, uterine artery red in color, Bladder and ureter yellow in color, Uterus in grey color

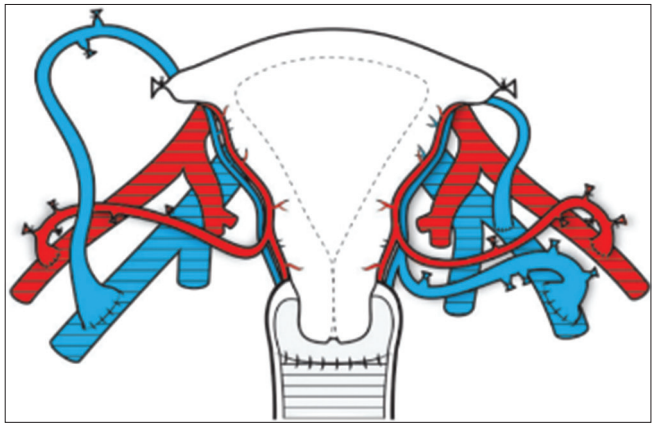


Figure 2: Vascular and vaginal anastomoses recipient tissues of recipient are lined the anterior portion of internal iliac arteries are anastomosed end to side to the external iliac arteries both sides. Left side deep uterine vein anastomosed end to side to the external iliac vein on right side utero-ovarian vein anastomosed end to side to external iliac vein

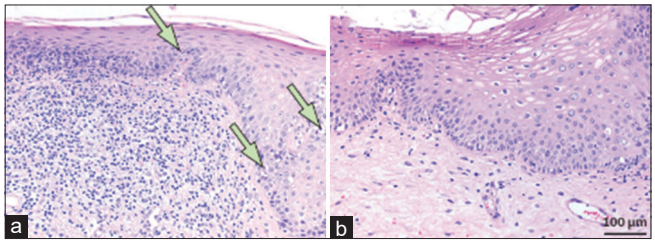


Figure 3: (a) Biopsy showing mild rejection. A dense infiltrate of leukocytes, mainly lymphocytes, exists in stroma and infiltrates into basal layers of epithelium, with occasional apoptotic cells (arrows) (b) 1 week after anti-rejection treatment, leucocyte infiltration completely reversed

with no difference in rejections. Tacrolimus (0.2 mg/kg/day) with maintenance blood level of 15–20 µg/mL in 1st month and 12–15 µg/mL in 2nd month. Mycophenolate mofetil is given at 2 g/day dose and prednisolone and azathioprine are given at 10mg/day and 2 mg/kg/day dose respectively.

Utx does not involve transplantation of fallopian tubes. *In vitro* fertilization (IVF) is required as a part of Utx process.

IVF

Ovarian reserve is generally good in MRKH patients. IVF before Utx is essential and is more beneficiary. In some cases, post-Utx IVF is required due to exhaustion of pre Utx embryo, or couple separated, the patient may want to attempt pregnancy with a new partner Post Utx. In such cases, IVF cycles have been tried post-Utx and been without complication resulting in live pregnancy.

Usually, a long protocol with gonadotropin-releasing hormone (GnRH) agonist and human chorionic gonadotropin trigger and a short protocol with GnRh antagonist and GnRH agonist trigger is used. Oocyte retrieval can be performed transvaginally or transabdominally.

ET

Frozen embryos are used commonly than frozen ocyte. 5–10 embryos required to be banked before Utx. Live birth rate per ET with cleavage stage verses blastocyte embryos is 12.5% and 4%, respectively.

Debatable issue is regarding whether to perform preimplantation genetic testing for aneuploidy (PGT-A). Argument in support of using PGT-A is that it reduces time to pregnancy, reduces cost, and reduces the risk of miscarriage and emotional burden.

Argument against using PGT-A is that its efficacy is questionable due to false negative and false positive, requiring additional oocyte retrieval. It is associated with adverse

obstetrics outcomes, leading to cause low birth weight, and maternal hypertension.

ET is done in routine manner. Transfer of a single embryo is compulsory in Utx. Increased risk of multiple pregnancy which can cause obstetric, neonatal, and postnatal complications in Utx.

Original protocol by Swedish group recommendation 1 year gap between Utx and ET. However short interval of 4–6 months been reported with uneventful recovery. Shorter interval between Utx and ET has psychological and physiological advantages with successful live birth.

Both spontaneous and exogenous hormone-induced programmed endometrial preparation are acceptable for ET.

Vaginal bacterial colonization especially in patients in whom neovagina is created can be associated with implantation failure and repeated miscarriage.

LIVE BIRTH AND OBSTETRICS OUTCOMES

In utx delivery by caesarean section is mandatory. Till date, total live birth rate/ET was 27.8% and 35.6%. The median gestational age at birth is 36 weeks 6 days. Almost 47% required 1-day neonatal intensive care unit stay.

HYSTERECTOMY

As explained in the flowchart, hysterectomy is a fate of Utx. Once a desirable number live children born, a hysterectomy is mandatory. It reduces burden of immunosuppressive agents and complications related to it recipients and her partner also needed to explain the right and need of exit causes in Utx. These causes may be graft-related, recipient-related, pregnancy-related, or psychology-related. Detail of causes has been enumerated in Table 2.

LONG-TERM HEALTH OUTCOME

Transplantectomy should take place after all pregnancy attempts have been made and if transplant graft fails. Qualitative research data based on repeated interview have been collected. Prospective data on the psychological and medical health of LD, recipient, and recipient partner were also collected.

LD: No major negative effects on health secondary to uterus donation. Donor psychological well-being may decrease if her donation does not lead to live pregnancy.

Table 2: Exit causes

Cause	Pathophysiology
Graft related	Ischemia-related graft dysfunction Untreatable intrauterine infection Endometrial atrophy Irreversible rejection
Recipient related	Severe nephrotoxicity Post-transplantation lymphoproliferative disease Malignancy Serious systemic infection needing omission of immunosuppression
Pregnancy-related	Malignant gestational trophoblastic disease Massively repeated implantation failure/miscarriages without childbirth Life-threatening obstetric bleeding, untreatable by conventional techniques
Psychology	Serious psychiatric disorder Recipient wish

Complications in LD

Due to uterus retrieval, minor to major complications have been seen in LD. Minor complications or morbidity includes Urinary tract infection, fecal impaction, wound infection, bladder hypotonia, leg pain, anemia, respiration failure during anesthesia, and depression.

Major morbidity is due to ureteric injuries. Preservation of uterine vein and complicated procedure of Utx causes various serious injuries to Ureter. Complications vary from intraoperative ureter transection, ureteric laceration, post-operative ureterovaginal fistula formation.

In future cases, there may have reduce chances of ureteric injuries, as use of ovarian or utero-ovarian veins instead of uterine vein will be done and has been tried in recent cases.

Recipient Health Outcome

Followed not only during graft retention but several years thereafter. Utx experience common worry about implantation failure at ET. Specific worries of graft rejection, when become mother, they feel like other mothers with the associated stresses and rewards. They had feelings of joy and frustrations of becoming complete women, changed self-perception, and a changed body and sexuality.

Recipient Partner

Relatively stable with no negative effects of graft failure. At 3 years, follow-up had negative deviation in HRQOL when birth had not yet been achieved. They had continued high satisfaction with marital relationship.

Child Health Outcome

Overall normal growth of both weight and height.

TRANSPLANT REJECTION

Symptoms of rejection include abdominal pain and fever or vaginal bleeding. Symptoms become apparent once rejection has been firmly established.

Grading system for uterine allograft rejection in which cervical biopsies were constant achievable means of detection of rejection on graft [Figure 3]. One of the signs of rejection in renal transplantation is lymphocyte subpopulation. Mild to moderate rejection can be managed by 3-day intravenous methylprednisolone. Severe rejection requires anti thymocyte globulin.

In uterine transplantation, the need of immunosuppression is temporary so less chance of cancer, diabetes mellitus, and nephrectomy.

ETHICS OF UTERINE TRANSPLANT

Ethical issues-related to Utx are different from other organ transplant as:

1. Uterus is life-giving or life-enhancing. When other organ transplant is to prevent recipient mortality
2. Uterine transplant has both elements of transplant medicine and ART
3. Prospect of uterine transplant underscores the potential moral and social not only for genetic parenthood but also gestational parenthood.

Montreal criteria for ethical feasibility of uterine transplant constitute comprehensive ethical guideline for uterine transplant. In this, there is a widespread agreement that the physical, psychological, and broader societal rules of uterine transplant ought to be identified and assessed.

Ethical calculus of balancing benefits requires consideration of four pillars of uterine transplant that is recipient, donor, recipient partner, and child to be born.

Ethical acceptability of uterine transplant likely depends on religion, moral, and legal particularities of different countries.

Ethical issues concern whether prevention of gestational parenthood should be promoted.

Individuals with MRKH in USA strongly desire for uterine transplant to become affordable and available. Cross-sectional study in USA suggests it is ethical and supports allowing women with AUFI for uterine transplant. Japanese population 32% women responders ready to become donor and 37% of male responders considered asking their partners to become donors.

Informed consent from potential donor and families whether it is a LD or dead donor is another major theme in ethical discussions. Through discussions of risk, benefit, and alternates are prerequisites including that LDs revoke all parental rights to any resulting children gestated from donated uterus and future relation with child is by no means guaranteed.

For individuals registered as dead donors, explicit consent from families or other representative is legally required.

Another ethical debate is in future if comparable level of clinical follow-up with both LD and dead donor achieved, then uterine transplant may no longer be ethically justifiable.

Informed consent: Recipient poses a greater risk than routine ART. Clear statement of risk of rejection, clear instructions about exit plan after desire pregnancies, and live birth achievement to prevent further risk associated with immunosuppression drugs. Or due to rejection of graft that cannot be managed. Association of complex emotional, ethical, and medical issues regarding termination of a desired pregnancy. Counseling regarding when the patient decides to retain the organ against medical advice regarding the safety of the mother and fetus.

Consent should include that recipient will not be able to feel same experience of pregnancy as normal pregnancy. She will not feel fetal movements and experience contractions.

Reproductive Autonomy

Individuals possess the capacity to self-determine their reproductive decisions. There can be negative rights and positive rights to gestation.

Other options available for AUFI, are gestation surrogacy and adoption. This options morally outweigh desire to have genetically and gestationally related Offspring.

Ethical disagreements exist around inclusion criteria for donor and recipient related to age, length of waiting time, relation status, and prior children.

Capacity after good parenting would likely be included in ethical issues.

Another issue is raised whether there is a right to a donor to decide which recipient her uterus to be transplanted to.

Ethics in XY Individuals

Uterus is preferred and allowed in genetically XX female. Utx May extend to genetically XY persons, including transgender male to female. As in individuals who had undergone gender transition process Utx could meaningfully contribute to the success of gender transformation after achieving gestation parenting.

Revise Montreal criteria suggest equal consideration in both assigned female at birth and male-to-female transgender. Often Ethical issues arise negatively on the appropriate designation of parenthood.

DEVELOPMENT AND FUTURE

Uterine transplantation is now a clinical treatment. It has been accepted in the national health system in Germany. An international quality registry of uterine transplant was launched by international Utx society in 2020. Advances in robotic and noninvasive rejection diagnosis focus on safety and efficacy, increase donor pool, and uterus bioengineering.

Robotic

Advantages are that it has magnified three-dimensional vision, articulated wrist instruments, tremor reduction, florescent images, and excellent surgery ergonomics.

First, robotic-assisted laparoscopic surgery is done. In 2021, fully robotic surgery was performed. Uterine transplant is done by robotic surgery in the recipient in 2021 with vascular and vaginal anastomosis. In this surgery, recovery was uneventful with fruitful birth of a healthy boy in May 2023. As skill advances, more and more robotic surgeries will have greater future in uterine transplant.

Non-invasive Rejection Diagnosis

As now, cervical biopsy is performed to identify rejection, which leads to an invasion procedure. In renal transplantation, new identification of biomarkers and lymphocyte markers, cytokines, and chemokines are developed to diagnose rejection. Studies are ongoing with multi – omics analysis of vaginal/cervical fluids to find noninvasive uterine biomarkers.

Increase of Donor Pool

- Following steps can be in cooperate to increase donor pool
- To motivate family-completed women at perimenopausal age for uterus donation
- Female to male transgender hysterectomized uterus to use for donation
- To increase the age for donation.

Bioengineered Uterus

Bioengineered uterus can be one of option for shortage of donor uterus. It is in an experimental basis in animals and uterine segments have been experiments, not whole uterus. It will take at least one decade to utilize a human bioengineered uterus to be prepare.

CONCLUSION

Uterine transplantation is a life-given on life enhancer. Before the first birth, after uterine transplant in year 2019, AUFI was regarded as unattainable. As experience increased safety and efficacy for the LD, recipient and child will continue and cost will likely to decrease. Improved ethical issues in uterine transplantation will go on an increase as advancement in indication in recipient and criteria for donor will change. Cost issue accepted under coverage health insurance will be a positive step in Utx.

Ray of hope is shouldered on bioengineered uterus in terms of uterine transplantation and then definitely uterine transplantation will be a widely accepted treatment option for infertility in AUFI.

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RESEARCH ARTICLE

Clinical Features and Outcome of Severe Acute Respiratory Infections during Covid-19 Pandemic in Tertiary Care Hospital

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ABSTRACT

Introduction: Severe acute respiratory infections (SARI) result in tremendous disease burden worldwide. With the COVID pandemic playing havoc in the whole world, common conditions like respiratory infections which account substantial childhood morbidity and mortality have received less attention. **Aims and objectives:** The aims and objectives of this were tostudy the clinical profile and outcome of SARI patients between 1 month and 12 years and its burden on the healthcare system during Covid19 pandemic. **Materials and Methods:** A retrospective study was conducted in a tertiary care hospital, from April 2020 to March 2021. Hospitalized patients between 1 month and 12 years diagnosed as SARI according to the World Health Organization case definition were included in the study. **Results:** In total of 834 admission, 58 patients of SARI were included in this student, in this observational study. The median age was 1 year. Complaints other than fever and cough were seen in-35 (60.34%) (fast/noisy-breathing, feeding difficulty, vomiting). Tachypnea in-43 (74.13%) and tachycardia in-34 (58.62) were most frequent signs. Nine were partially immunized (15.51%). Eight (13.79%) were moderately malnourished, whereas three (5.17%) were severely malnourished. 44 (75.86%) had abnormal chest X-ray, 41 (70.68%) were anemic, 37 (63.79%) had leukocytosis, and 38 (65.5%) had raised C-reactive protein. Only one (1.7%) blood culture was positive. Five (8.62%) presented with shock requiring inotropes.17 (29.31%) received combination of antibiotics with antivirals and two patients were diagnosed as pulmonary tuberculosis and started on anti-tubercular treatment. Pediatric intensive care unit admission was required in 14 (24.13%). Overall outcome of SARI patients was good with median hospital stay of 7 days. Only one patient with septic shock succumbed. **Conclusion:** SARI was not uncommon cause of hospitalization during Covid-19 pandemic. It added extra burden healthcare system in addition to Covid-19.

Key words: Lower respiratory tract infection, human bocavirus, SARI

INTRODUCTION

Severe acute respiratory infection (SARI) remains a major global cause of morbidity and mortality across all age groups, with particularly high vulnerability among children, the elderly, and individuals with compromised immune, cardiac, or pulmonary function.[1-3] It is estimated that SARI is responsible for approximately 4.2 million deaths each year, with up to 90% of these occurring in developing countries.[4] A wide range of viral and bacterial pathogens are associated with SARI, many of which have a high potential for human-to-human transmission, posing significant public health risks. Although bacterial infections play a crucial role in the development of severe pneumonia,[5] a considerable proportion of SARI cases are linked to viral pathogens such as influenza A and B viruses, parainfluenza viruses,

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adenoviruses, respiratory syncytial viruses (RSVs), human coronaviruses, and human rhinoviruses (HRhVs).[6]

However, due to the absence of rapid, gold standard diagnostic tools for early identification of causative pathogens, most SARI cases are managed empirically with antibiotics.[7] This highlights an ongoing public health challenge in achieving timely etiologic diagnosis. Continuous pathogen surveillance is therefore essential for epidemic preparedness and response. Given that SARI is a leading cause of hospitalization in children under 5 years of age and of febrile illness in infants below 3 months,[8-11] most existing studies on SARI burden have focused on pediatric viral infections. For example, a surveillance study conducted in China reported that 90% of SARI cases involved patients under 15 years of age.[12] In addition, most epidemiological data regarding SARI pathogens have been generated in developed countries, whereas information on the distribution and prevalence of major viral pathogens in adult SARI patients in developing regions remains scarce.[13]

MATERIALS AND METHODS

Study Setting

One year active surveillance was initiated at Smt. Kashibai Navale Medical College and Hospital from March 2020 to April 2021 during the COVID-19 pandemic. This hospital was selected because it is the largest general hospital in the district. It serves most of the population in Pune district, with a total of 600 beds.

Study Subjects

All patients aged between 1 month and 12 years admitted to the intensive care unit and general wards of the hospital were screened by a trained physician from March 2020 to April 2021. The diagnosis of SARI was made based on the World Health Organization case definition, which includes an acute respiratory infection with a measured fever of ≥38°C, onset of cough within the past 10 days, and requiring hospitalization.[8]

Data Collection

Upon admission, a standardized case report form was completed for each eligible patient. This form collected information on demographic details (age, sex, weight, height, and residence), vaccination history (receipt of influenza vaccine within the year before illness onset and history of pneumococcal conjugate vaccine administration), admission diagnosis, presenting symptoms (fever, cough, difficulty breathing, and sore throat), history of antibiotic use before hospitalization, and any relevant exposure history.

At the time of discharge, the case report form was updated to record details about in-hospital treatment, chest radiograph findings, complications, and final outcomes. Data collection was carried out by post-graduate residents. To ensure data reliability, information was cross-verified through interviews with the patient's spouse or caregiver who had lived with the child for at least 2 weeks before illness onset, along with a review of the patient's medical records.

Ethics Statement

This study was part of a hospital-based SARI surveillance program in Smt. Kashibai Navale Medical College Hospital and was approved by the ethical review committee. Dated March 24, 2021 Ref. SKNMC/Ethics/app/2021/808.

RESULTS

Demographic Characteristics

From March 2020 to April 2021, a total of 58 patients meeting the SARI case definition were admitted to our hospital. The median age of the patients was 1 year (range: 1 month–12 years). Among the SARI patients, 38 (65.51%) were male, and 20 (34.5%) were female. The majority of patients were toddlers 36, accounted for 62.06% of the total patients; 22 were >2 years (37.93%) table.

Clinical and Epidemiological Characteristics

Pneumonia (33 cases, 56.89%) was the most common clinical diagnosis made by clinicians on admission, followed by Bronchiolitis (16 cases, 27.8%) and 9(15.5%) were other [Figure 1].

The most common symptom on admission was cough seen in 57 (99.2%) patients. Complaints other than fever and cough such as vomiting, difficulty in breathing and feeding in neonates, and infants were seen in 35 (60.34%) patients. Forty-four patients (75%) were reported to have radiographic evidence of pneumonia [Figure 2]. Associated risk factor of severe acute malnutrition was seen in Twenty-one patients.

Twenty patients were exposed to a family member with similar respiratory complaints of fever and cough, whereas none of them were tested positive.

Similarly, 38 patients had positive family contact with COVID-19, but none of them were tested positive [Figure 3].

Among the 58 patients, only 49 (84.44%) patients were fully immunized as per age, and 8 (13.79%) patient was partially immunized and one was unimmunized. As illustrated in table, 41 (70.68%) were anemic, 37 (63.79%) had leukocytosis, 38 (65.5%) had raised C-reactive protein. Only-one (1.7%) blood culture was positive.

Five (8.62%) presented with shock requiring inotropes. Pediatric intensive care unit (PICU) admission was required in 14 (24.13%).

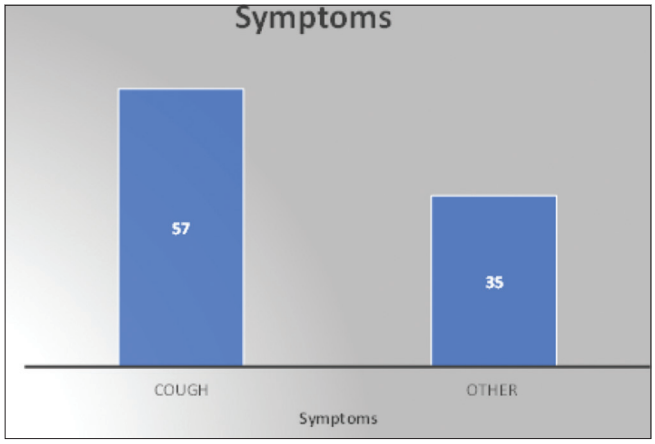

Figure 1: Clinical characteristics

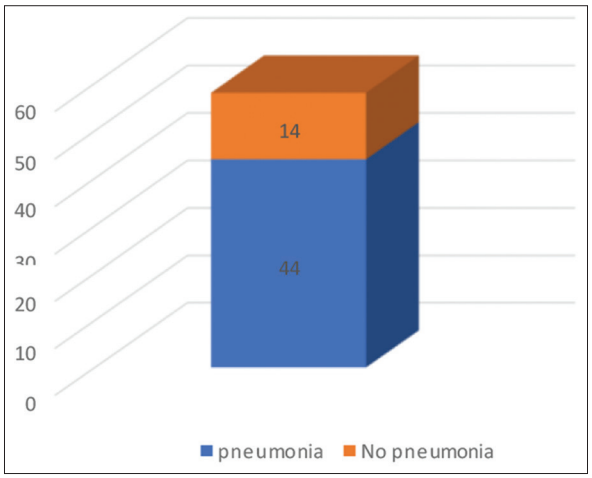

Figure 2: Radiological evidence of pneumonia

Overall outcome of SARI patients was good with a median hospital stay of 7 days. Only one patient with septic shock succumbed.

Seasonal Trends

Out of 58 patients, two were admitted between June 2020 and November 2020, one third other than this period [Figure 4].

Treatment and Prognosis

The median duration from illness onset to admission in SARI patients was 3 days (range: 0–10 days), and the median duration of hospitalization was 6.5 days (3–16 days). Complications occurred in 14 (24.13) SARI patients, requiring PICU admission. 9 patients require mechanical ventilation (15.51%) and 5 require ionotropic support. The remaining 49 patients did not report any complications. No significant differences between SARI patients requiring antibiotic 41 (70.68%) therapy and those 17 (29.31%) antiviral therapies were seen.

Two patients were diagnosed with pulmonary tuberculosis and started on AKT.

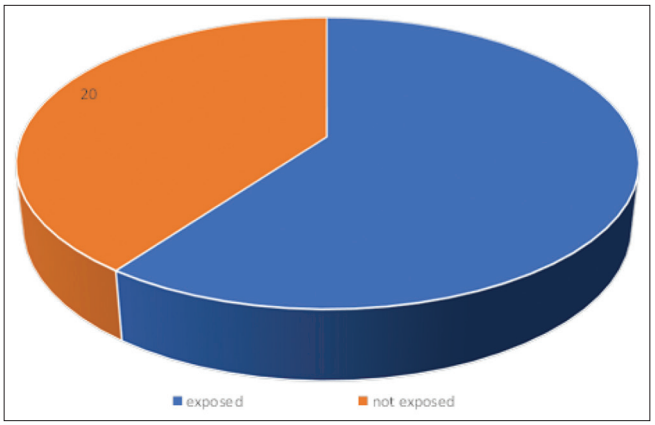

Figure 3: Patients exposed to Covid-19

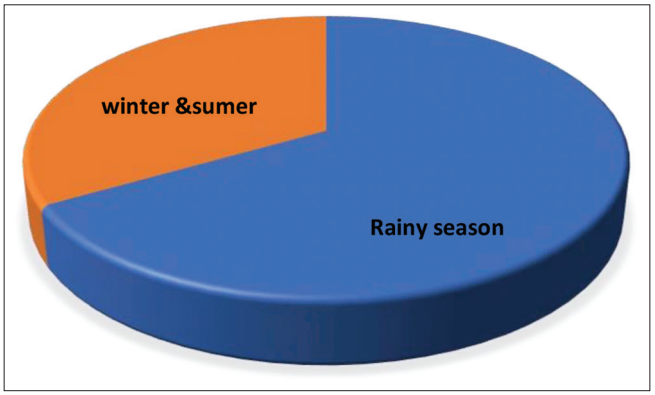

Figure 4: Seasonal trends of severe acute respiratory infections patients

DISCUSSION

Hospital-based sentinel surveillance for SARI serves as an important strategy for tracking trends in this significant clinical condition and plays a vital role in establishing a framework to assess the epidemiological and etiological profiles at the local level. Evidence from a surveillance study in Georgia demonstrated considerable seasonal variation in the proportion of SARI patients testing positive for respiratory pathogens. Similarly, a comparative analysis of viral etiologies among hospitalized pediatric SARI patients in Beijing and Shanghai revealed distinct viral patterns between the two cities. In Beijing, RSV (52.9%) and HRhVs enterovirus (EV) (34.7%) were the leading causative agents, while in Shanghai, HRhV/EV (33.6%) and human bocavirus (17.7%) predominated as primary pathogens.[10]

Early detection of varied SARI pathogens through sentinel surveillance systems not only helps quantify disease burden based on severity but also enhances regional preparedness for timely public health emergency responses.

CONCLUSION

SARI was not uncommon cause of hospitalization during Covid-19 pandemic. It added extra burden health care system in addition to Covid-19.

Limitation of Study

Isolation of specific pathogenic organism was not done it would be helpful for differentiation of various etiological agent as per age seasonal variation among etiological agent could have been add benefit to understand sari during Covid-19 pandemic.

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REVIEW ARTICLE

Adult Vaccination: Unmet Needs and Public Health Implications

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ABSTRACT

Immunocompromised (IC) populations are at increased risk of vaccine-preventable diseases (VPDs). In India, the concern of VPDs in IC populations is particularly acute due to the prevalence of crowded living situations, poor sanitation, and variable access to healthcare services. We present a narrative review of IC-related disease and economic burden, risk of VPDs, and vaccination guidelines, based on global and India-specific literature (2000–2022). IC conditions considered were cancer, diabetes mellitus, chronic kidney disease, respiratory disorders, disorders treated with immunosuppressive therapy, and human immunodeficiency virus (HIV). The burden of IC populations in India is comparable to the global population, except for cancer and HIV, which have lower prevalence compared with the global average. Regional and socioeconomic inequalities exist in IC prevalence; VPDs add to the burden of IC conditions, especially in lower-income strata. Adult vaccination programs could improve health and reduce the economic impact of VPDs in IC populations.

Keywords: Immunocompromised (IC), vaccine-preventable diseases (VPDs), human immunodeficiency virus (HIV)

INTRODUCTION

The population is aging, both globally and in India. Older age is associated with a weakened immune system. People with an immunocompromised (IC) status have a higher risk of contracting infections. The combination of these conditions greatly increases the risk from infectious disease. A large percentage of infections, referred to as vaccine-preventable diseases (VPDs), could be avoided by vaccination. However, India-specific guidelines for adult immunization are limited and there is a low awareness of these recommendations among healthcare professionals and patients.

Adult vaccination is a critical but often neglected public health priority globally, with particularly low coverage in India. Immunization helps prevent infectious diseases across all age groups, yet adult vaccination rates remain suboptimal. The consequences include increased morbidity and mortality, higher healthcare costs, and economic losses. Factors such as vaccine hesitancy, misinformation, accessibility challenges, and lack of awareness contribute to low uptake. While global and Indian initiatives address these gaps, significant policy changes and targeted interventions are required.

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GLOBAL LANDSCAPE OF ADULT VACCINATION

India is projected to be the most populous country in the world very shortly.

The population of adults aged ≥60 years is growing at a rate three times faster than that of the total Indian population and will account for 19% of the worldwide population by 2050 according to projections.[1]

This shifting age structure, alongside rapid urbanization, lifestyle transitions, deteriorating diets, and pollution, has resulted in a growing burden of immunocompromising non-communicable diseases (NCDs).[2,3]

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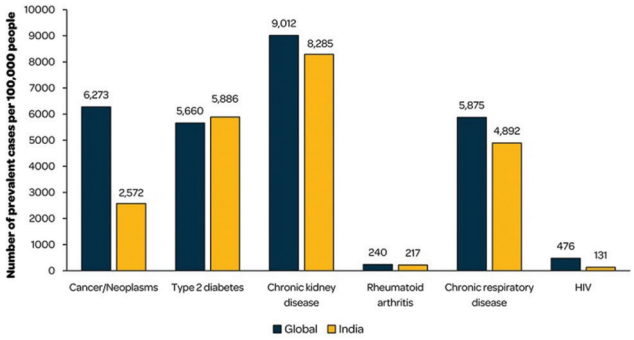
NCDs have become the primary cause of mortality in India, accounting for 60% of total deaths.[4,5]

The most prominent NCDs contributing to the overall IC population in India include cancer; disorders treated with immunosuppressive therapy, such as autoimmune diseases and transplant patients; diabetes mellitus, and chronic kidney disease. Communicable diseases, foremost human immunodeficiency virus (HIV), add to the overall size of the IC population in India.

Risk factors for NCDs in India have been evaluated in a systematic review: the authors found a significant increase in overweight and obesity among adults during the observation period between 2005 and 2016. Obesity favors the development of cardiac disease and diabetes; on the other hand, alcohol and tobacco consumptions, risk factors for cancer and chronic liver disease, declined.[2]

Similarly, NCDs treated with immunosuppressive therapy increase the risk of infectious disease. Autoimmune disorders, such as rheumatoid disorders, multiple sclerosis, and inflammatory bowel disease, as well as people with asthma and transplant recipients, are in general treated with immunosuppressive therapy.

However, with the increased use of immunosuppressive therapy, the concern for infections in general, and tuberculosis in particular, has sharpened, adding to the burden of rheumatoid disorders.[6]



CURRENT COVERAGE AND TRENDS

Despite efforts to promote adult immunization, vaccine coverage remains inadequate worldwide. A report by GSK and IQVIA revealed that over 100 million adult vaccine doses were missed globally in 2021–2022 compared to pre-pandemic projections. Human papillomavirus vaccine coverage is alarmingly low, with only 27% of girls and 7% of boys receiving the first dose. In the U.S., overall adult vaccination rates remain low, with just 22.8% of adults aged 19 and older receiving recommended vaccines.

Disparities in coverage exist across socioeconomic and ethnic groups. For example, pneumococcal vaccination rates among adults aged 65+ in the U.S. are highest among White adults (69.1%) but significantly lower among black (53.5%), Hispanic (41.7%), and Asian (50.2%) populations. These gaps highlight the need for equitable vaccine access.

IMPACT OF THE COVID-19 PANDEMIC

The COVID-19 pandemic disrupted routine vaccination services, leading to a significant backlog in immunization efforts. An estimated 2.2 billion people worldwide remained unvaccinated against COVID-19, with the vast majority residing in low-income countries. The pandemic underscored the importance of adult immunization while also exacerbating pre-existing inequalities.

DISCUSSION

IC conditions combined with an increased risk of VPDs impose a high burden on patients and their families, as well as the healthcare sector. The burden of IC is not distributed uniformly in India. Some geographic regions and socioeconomic strata have significantly higher prevalence rates compared with others. For example, cancer and HIV prevalence were highest in North and Northeast regions. In addition, low-income households bear a proportionally higher economic burden due to IC conditions compared with the middle- and high-income classes. Most of the disease burden due to IC conditions occurs when people are in their peak working and earning years, thus affecting productivity and economic development.[7]

Preventative measures, such as immunization programs, could reduce the burden of illness in IC adults, thereby minimizing the impact on working hours and the economy.

Mass immunization programs are effective strategies to lower the disease and economic burden of VPDs both at the individual level and from a health-economic perspective. Despite undoubted benefits of adult immunization, vaccination coverage remains suboptimal even in high-income countries. Barriers to vaccination include limited healthcare encounters, lack of specific recommendations, and limited awareness of health benefits conferred by vaccination. An additional challenge in vaccinating people with IC conditions concerns the varying levels of altered immunocompetence. Individuals with a severe IC status may have an inadequate immunogenic response to vaccines; the level of altered immunocompetence should be determined before vaccination by the physician, rendering vaccination strategies even more complex.[8]

It has been reported that socioeconomic status is strongly correlated with vaccination status; in the richest areas of India, the vaccination coverage is indeed two times higher compared with the poorest areas.[9,10] India's universal immunization program covers eleven vaccines, but these are mainly for children and pregnant women.[11] Therefore, IC adults in India have to pay for their vaccinations themselves, which places a huge additional financial burden on the Indian population for whom the cost of IC treatment is already high; This acts as a significant barrier to the acceptance of vaccines.[12]

A lack of education about the role of vaccination and concerns about vaccine efficacy and potential side effects are additional factors contributing to the poor rates of adult vaccination.[13,14] In India, one survey reported that 68% of adults were not aware of the vaccines recommended for them, and 38% of adults perceived immunization as being for children only.[15,16]

Cultural and religious factors also pose a barrier to vaccination among IC adults in India. Western biomedicine and indigenous medicine coexist and adherence to either of these is distributed along a wide spectrum. Within some communities, there is little acceptance of Western medicine, including vaccinations.[17] However, if vaccine education is delivered in a culturally responsive and sensitive way, there is still the possibility to reach people in these communities.

LOW COVERAGE AND BARRIERS

India faces significant challenges in adult vaccination, with negligible coverage for key vaccines. A study of adults aged 45+ found extremely low immunization rates for influenza (1.5%), pneumococcal disease (0.6%), typhoid (1.9%), and hepatitis B (1.9%). Even among older adults (60+), the highest coverage was for diphtheria and tetanus (2.75%), reflecting a lack of established adult immunization practices.

BARRIERS TO ADULT VACCINATION IN INDIA INCLUDE

- Lack of national guidelines: The absence of clear immunization recommendations results in inconsistent healthcare practices
- Public perception and awareness: Vaccination is widely viewed as a childhood necessity, with little emphasis on adult immunization
- Limited accessibility: Healthcare infrastructure is primarily designed for pediatric vaccines, leading to a shortage of adult vaccination centers
- Financial constraints: Many vaccines are not covered under public health schemes, making them unaffordable for lower-income populations.

IMPACT ON INDIA

India accounts for a high proportion of global cases of diseases like diphtheria, tetanus, and Japanese encephalitis. The lack of adult vaccination exacerbates this burden, leading to preventable hospitalizations and deaths. Older adults and those with chronic conditions are at heightened risk, yet their vaccine coverage remains critically low.

CONCLUSION

IC populations in India pose an increasing challenge for the healthcare and social welfare system. Vaccines are one of the most cost-effective health interventions available and the implementation of successful adult immunization programs is imperative, particularly for the most vulnerable adult populations. A rapidly growing older population, inequalities in healthcare access, and the absence of a public immunization program targeting the adult population complicate the task of providing nationwide immunization against VPDs. Following the COVID-19 pandemic, India has an unprecedented opportunity to leverage the infrastructure put in place for the COVID-19 vaccination campaign to provide nationwide immunization coverage against other VPDs.

Several countries have adopted lifelong vaccination policies, recognizing the need to maintain immunity throughout adulthood. Key strategies include:

- Digital health records: Systems that track vaccination status and send reminders improve adherence
- Expanded access: Making vaccines available at pharmacies and primary care clinics increases convenience
- Healthcare provider engagement: Physicians' recommendations significantly influence vaccination uptake
- Public awareness campaigns: Addressing misinformation through targeted education improves vaccine confidence.

India's Universal Immunization Programme primarily targets children and pregnant women, with limited provisions for adult vaccines. However, some steps have been taken to improve coverage:

- Digital platforms: The U-WIN portal, initially developed for COVID-199 vaccinations, has the potential to expand into adult immunization tracking
- Medical society guidelines: Organizations like the Indian Medical Association and the Association of Physicians of India have issued recommendations for adult vaccines, though implementation remains limited
- Vaccination clinics: Centers like AIIMS Jodhpur have established dedicated adult vaccination facilities, but these remain few and far between.

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CASE SERIES

Case Series on Anatomical Variants of Paranasal Sinuses on Computed Tomography

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ABSTRACT

A comprehensive understanding of paranasal sinus anatomy is crucial for clinicians. Traditional radiological techniques fall short in detailing the nasal cavity and paranasal sinuses, which are now better visualized through computed tomography (CT) imaging. CT provides detailed anatomical perspectives and identifies common anatomical variants. Recognizing these variants is essential for the safe application of modern endoscopic sinus surgery, as it helps avoid potential complications. Multidetector CT is increasingly used to image the paranasal sinuses before functional endoscopic sinus surgery. Multiplanar imaging, particularly coronal reformations, offers accurate insights into sinus anatomy and its variations, which is vital before surgical procedures. This study focuses on anatomical variants in the nasal fossae and paranasal sinuses observed through CT and highlights several common anatomical variations, excluding broader anatomical variations such as deviated nasal septum and concha bullosa.

Keywords: Anatomic variants, computed tomography, functional endoscopic sinus surgery, paranasal sinuses, sinusitis subject – radiology

INTRODUCTION

The paranasal sinuses are typically composed of four paired air-filled cavities. They play various roles, including reducing head weight, humidifying air, and enhancing voice resonance. These sinuses are named according to the facial bones in which they are located:

1. Maxillary sinus
2. Sphenoid sinus
3. Ethmoid sinus
4. Frontal sinus.

Variant Anatomy

Paranasal sinuses exhibit significant variability between individuals and even between sides within the same individual, in terms of size and bony septations. Notable anatomical variants include:

- Haller cells
- Onodi cells
- Agger nasi cells
- Aerated crista galli
- Anterior clinoid process pneumatization
- Isolated frontal sinus agenesis
- Accessory ostia of the maxillary sinus
- Posterior nasal septal air cell
- Total paranasal sinus agenesis
- Protrusion and/or dehiscence of – internal carotid artery.
  - Optic nerve
  - Maxillary nerve
  - Vidian nerve.
- Pneumatization of pterygoid processes
  - Greater wing of the sphenoid
  - Sphenoid sinus septa attachment on the bony canal of the optic nerve.

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CASE SERIES

Case 1

A 27-year-old female presented with complaints of nasal obstruction and headache for 1 month.

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Following is the computed tomography (CT) imaging [Figure 1] –

Discussion

Haller cells, or infraorbital ethmoidal air cells, are located lateral to the maxillo-ethmoidal suture along the inferomedial orbital floor. Present in approximately 20% of patients, they are typically asymptomatic.[1,2] However, they can cause complications if infected, narrow the ipsilateral ostiomeatal complex, or lead to inadvertent orbital entry during endoscopic surgery.[3]

Case 2

A 65-year-old female with a history of sinusitis underwent a CT scan for complaints of sinusitis.

Following is the CT imaging [Figure 2] –

Discussion

The Onodi cell, a type of sphenoethmoidal air cell, varies in prevalence from 3.4% to 60%.[4,5] These cells are usually asymptomatic but can become problematic if complicated by sinus disease due to their proximity to critical structures such as the optic nerve and internal carotid artery.[4] Potential damage to these critical structures occurs when attempts to enter the sphenoid sinus endoscopically are made by passing through the posterior wall of the sphenoethmoidal air cell expecting to enter the sphenoid sinus.

Case 3

A 33-year-old male came with complaints of nasal obstruction, nasal discharge, facial pain, headache, halitosis, and anosmia for 14 weeks.

Following is the CT imaging [Figure 3] –

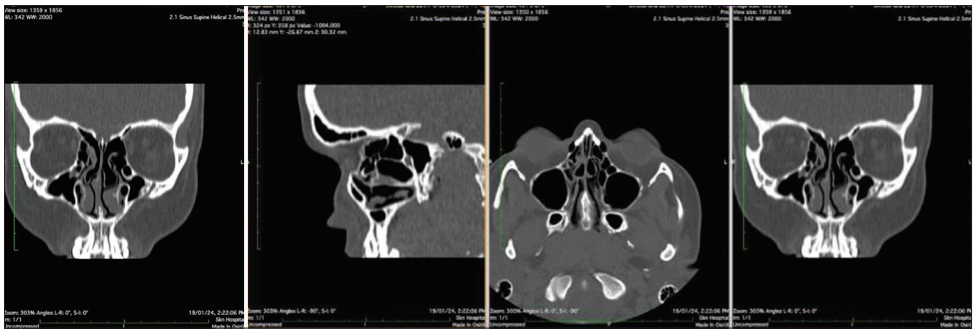

Figure 1: Haller cell (left infraorbital) is best visualized in the coronal plane on CT

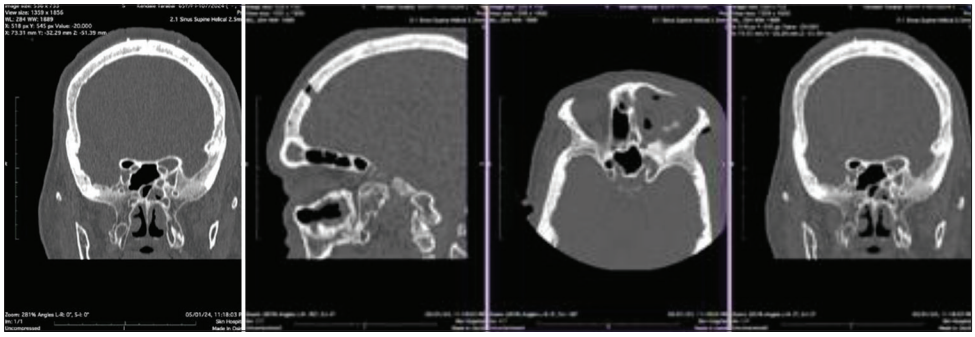

Figure 2: Onodi cell (right superolateral to sphenoid sinus) is best visualized in the coronal plane on CT

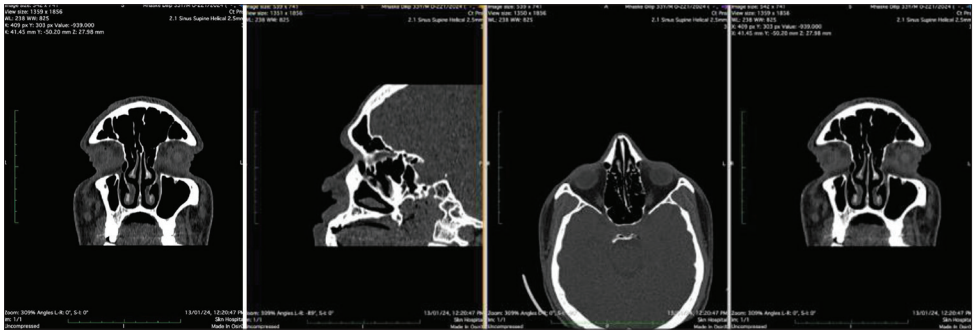

Figure 3: Agger nasi cell (anteroinferior to frontoethmoid recess) is best visualized in the coronal plane on CT

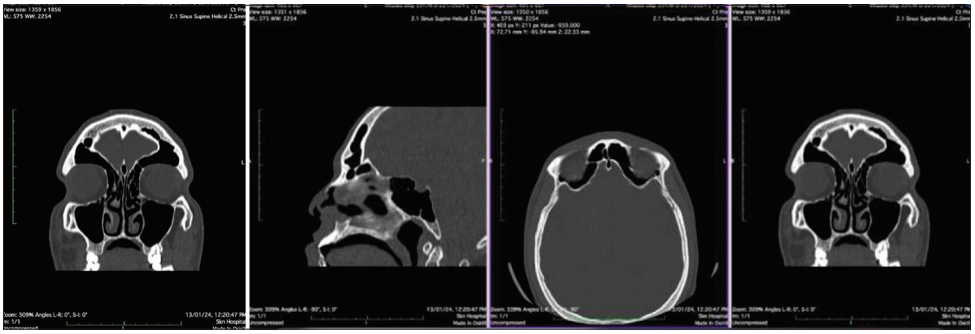

Figure 4: Aerated crista galli in the coronal plane on CT

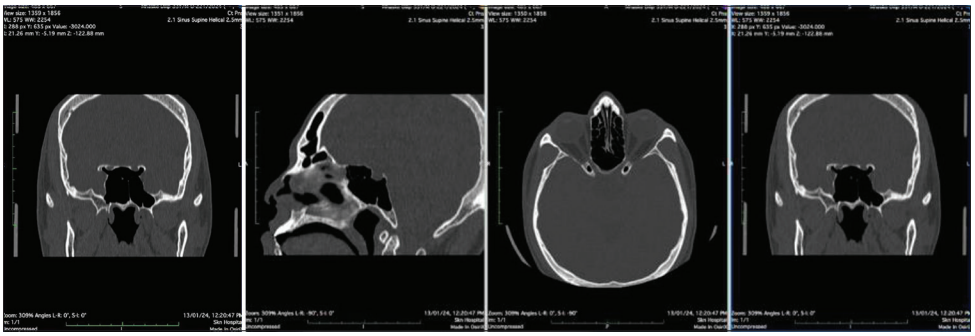

Figure 5: Bilateral pneumatization of the anterior clinoid process in the coronal plane on CT

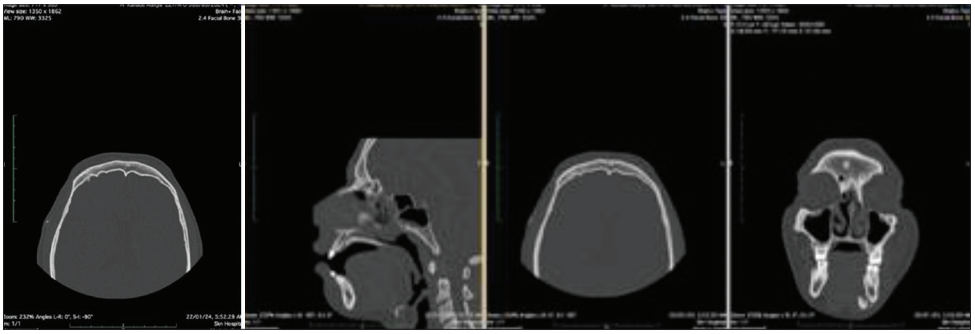

Figure 6: Bilateral aplasia of frontal sinus in the axial plane on CT

Discussion

Agger nasi cells are anterior ethmoidal air cells that can narrow the nasofrontal recess, potentially leading to frontal sinus disease.[6] They are present in 90% of individuals and should not be confused with other types of air cells.

Case 4

A 33-year-old male came with complaints of nasal obstruction, nasal discharge, facial pain, headache, halitosis, and anosmia for 14 weeks.

Following is the CT imaging [Figure 4] –

Discussion

The crista galli, which develops from the mesial mass of the ethmoidal cartilage, typically ossifies postnatally.[7] Aerated crista galli is generally an incidental finding.

Case 5

A 33-year-old male came with complaints of headaches and visual disturbances for 4 weeks.

Following is the CT imaging [Figure 5] –

Discussion

The anterior clinoid processes can occasionally be pneumatised. This condition, found in 6–24% of cases, can lead to complications if the sphenoid sinus wall becomes incompetent.[8]

Case 6

A 22-year-old male with a history of sinusitis underwent a CT scan for complaints of sinusitis. Following is the CT imaging [Figure 6] –

Discussion

Frontal sinus development begins late in intrauterine life and can vary, with aplasia occurring in approximately 5% of cases.[9] This variation can have implications for surgical procedures due to the proximity of the sinus to the orbit and anterior skull base.[10]

CONCLUSION

Anatomical variations in the sinus cavities are common and can be found in many individuals. No significant differences were noted in the incidence of sinus variability between patients with minimal or significant radiological signs of sinusitis. However, recognizing specific anatomical variants is crucial for planning endoscopic or other skull base surgeries to minimize complications.

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CASE SERIES

Correlation of Liver Function Test and Serum Bile Acid with Feto-Maternal Outcome in Patients with Intrahepatic Cholestasis of Pregnancy - Case Series

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ABSTRACT

Background: The incidence of intrahepatic cholestasis of pregnancy (IHCP) in India is 0.02–2.4% IHCP is the foremost liver disorder, presenting substantial risks and complications to maternal and fetal health. Characterized by pruritus and elevated bile acids and serum transaminases. **Materials and Methods:** The study focuses on profiling 6 patients of ICP understanding the correlations between liver function tests with serum bile acid and evaluating the impact of ursodeoxycholic acid (UDCA) treatment and also focus on various maternal and fetal outcome. **Results:** The study identified a predominance of primigravida (83%) of 26–30 years of age (66%), with maximum patients with moderate serum bile acid levels. IHCP diagnosis was commonly noted between 32 and 36.6 weeks GA (66.6%). The treatment with UDCA 300-BD (in 66% of patients) was providing relief to about 66% of participants within a week. Most deliveries occurred between 37 and 39 weeks GA, predominantly through vaginal Deleveries (83%). Post-partum hemorrhage was seen in 33% of patients. Fetal outcomes revealed a 66% incidence of meconium-stained liquor and about 33% neonatal intensive care unit admissions with no fetal mortality. Most participants (83%) had serum bile acid levels in the 10–40 µmoL/L range. **Conclusion:** Significant correlations were noted between serum glutamate oxaloacetate transaminase and serum glutamate pyruvate transaminase and with alkaline phosphatase and bile acid. In contrast, bilirubin showed no significant correlations. Higher UDCA dosages showed a dose-response relationship, implying their effectiveness in managing ICP.

Keywords: Intrahepatic cholestasis of pregnancy, serum bile acid, serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase, ursodeoxycholic acid

INTRODUCTION

Pregnancy induces various physiological alterations that influence maternal health. These changes can interact with existing health predispositions, leading to complications specific to pregnancy.[1]

The incidence of IHCP in India is - 0.02–2.4%.[2]

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Obstetric cholestasis is a liver disorder unique to pregnancy, which typically presents with pruritus. However, pruritus is common in pregnancy and the diagnosis of obstetric cholestasis is confirmed by finding abnormal liver function.[2] Intrahepatic cholestasis of pregnancy or obstetric cholestasis is the most common pregnancy-related liver disorder and is characterized by pruritus, elevated serum-aminotransferases, and bile-acid levels with onset in the second or third trimester of pregnancy and spontaneous relief of symptoms within a 2nd or 3rd week after delivery. It typically presents with troublesome itching and can lead to complications for both mother and fetus.[3]

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A hallmark of ICP is the marked elevation in the serum bile acid level ICP.[1]

Further, it is common to observe serum aminotransferases at levels exceeding twice the normal range, along with increased alkaline phosphatase levels.[1]

The underlying causes of intrahepatic cholestasis of pregnancy (ICP) remain elusive, involving a complex interplay of genetic, hormonal, and environmental elements.[4]

It's hypothesized that genetic factors make some women more vulnerable to the condition, especially in cases where familial patterns or recurrence in subsequent pregnancies are observed.[5]

Hormonal influences, particularly the impact of elevated estrogen levels, have been consistently noted in various situations such as multiple pregnancies, ovarian hyper-stimulation, and ICP's typical emergence in the late second trimester, coinciding with peak estrogen levels.[6]

ICP is associated with several maternal complications including increased risks of severe pruritis, dyslipidemia, deranged Doppler, pre-term rupture of membranes, operative delivery, and post-partum hemorrhage.

Increased bile acids and other factors can lead to severe fetal complications, including sudden intrauterine death, pre-term birth, and meconium-stained amniotic fluid). The immediate treatment upon diagnosing ICP focuses on reducing perinatal morbidity and alleviating maternal discomfort. Ursodeoxycholic acid (UDCA) is the preferred treatment, known to correlate with improved maternal symptoms and fetal outcomes, and neonatal unit admission.[7,8]

Our study is thus strategically focused on scrutinizing the relationship between liver function tests (LFTs), serum bile acid levels, and their correlation with feto-maternal outcomes. By investigating the diagnostic patterns of LFTs and other biomarkers in light of variable manifestations of ICP, our research endeavors to enhance maternal and fetal health outcomes, mitigating the risks associated with undiagnosed or poorly managed ICP.

Aims and Objectives

Aim

To correlate LFTs and Serum Bile acid with feto-maternal outcome in patients with intrahepatic cholestasis of pregnancy (ICP).

Objectives

1. To correlate LFT and Serum bile acid in patients with intrahepatic cholestasis of pregnancy
2. To assess its effect on maternal morbidity and pregnancy outcome
3. To assess the perinatal morbidity and mortality associated with IHCP.

MATERIALS AND METHODS

Study Area

The present study has been conducted in antenatal care (ANC) and the labor ward of Smt. Kashibai Navale Medical College and general hospital Pune.

Study Population

All were diagnosed with IHCP attending an antenatal clinic or to be admitted in a hospital during the study period from January 2024 to January 2025.

Study Design

This study is a hospital-based prospective observational study.

Inclusion Criteria

All pregnant women (singleton/multiple gestations) diagnosed with intrahepatic cholestasis of pregnancy in antenatal ward and labor ward of Smt. Kashibai Navale Medical College and general hospital Pune.

Exclusion Criteria

- Pregnancy <24 weeks
- Dermatological lesion with pruritus
- Acute or chronic liver disease
- Infective hepatitis
- Any liver/gall bladder disorder before pregnancy.

Methodology

After ethical committee approval.

All antenatal patients who attended the antenatal clinic at Smt. Kashibai Navale Medical College and diagnosed with IHCP were included in the study after exclusion criteria were applied as previously mentioned and informed consent was obtained.

The diagnosis was based on clinical symptoms of persistent pruritus without a skin rash, coupled with biochemical evidence of cholestasis of pregnancy, such as elevated serum transaminases (alanine transaminase >40, aspartate transaminase >40 U/L), and Serum Bile acid levels exceeding 10 μmoL/L.

Patients were categorized as mild, moderate, and severe as per Serum bile acid level.

All the data were entered into a preformed pro forma, which included detailed history, such as presenting complaints,

obstetric history, menstrual history, past medical history (including previous IHCP or liver disorders), personal history, and family history. General physical examinations and obstetric examinations were conducted. A comprehensive set of ANC investigations, including complete blood count, blood typing and Rh grouping, blood sugar levels, viral markers (HIV, HBsAg,), venereal disease research laboratory, thyroid profile, LFTs, kidney function tests, and ultrasound scans with or without color Doppler, were performed. Fetal monitoring was done with non-stress tests and biophysical profile scores.

Patients diagnosed with IHCP were monitored with repeated LFT and Serum Bile acid tests after 1–2 weeks or as needed. UDCA was administered in divided doses to patients with IHCP based on the levels of LFT and Serum bile acid for the remainder of the antenatal period. Patient follow-up extended throughout the pregnancy until delivery, and their perinatal and maternal outcomes were analyzed based on LFT and Bile acid levels.

Statistical Analysis

We initiated our analysis with a thorough descriptive examination of the data. This involved summarizing the central tendencies and variability of LFT parameters and serum bile acid levels using appropriate measures such as means, medians, standard deviations, and interquartile ranges.

OBSERVATIONS AND RESULTS

In our study period total 1,703 deliveries took place out of that 6 cases were reported of IHCP and delivered this accounts for 0.35% study participants profile:

In terms of age distribution, the majority of the study population falls within the 26–30 years age group, accounting for 66%, followed by 31–35 years. The 18–25 years and >35 years age groups are less represented. This suggests a higher prevalence of IHCP among women in their late twenties to early thirties Table 1.

When examining parity, the data reveals a significant inclination toward first-time pregnancies, with 83% of the participants being primigravida than women in their second and third pregnancies indicating that ICP is more commonly diagnosed in first pregnancies.

Hypertensive disorders are slightly more prevalent according to the background characteristics. This higher percentage might reflect an increased risk of fetal distress or could be linked to other underlying conditions Table 2.

Regarding the diagnosis of ICP, it is predominantly diagnosed in the later stages of pregnancy. This timing emphasizes the importance of vigilant monitoring for ICP symptoms in late second to early third trimester.

Table 1: Frequency distribution of study participants by background characteristics - mother's profile

Background characteristics	Years	*n* (%)
Age groups	18–25	0
	26–30	4 (66)
	31–35	2 (33)
	>35	0
Parity	1	5 (83)
	2	1 (16.6)
	3	0
H/O OCP use	No	4 (66.6)
	Yes	2 (33)
Hormonal support	No	3 (50)
	Yes	3 (50)

Table 2: Frequency distribution of study participants by background characteristics - obstetric characteristics

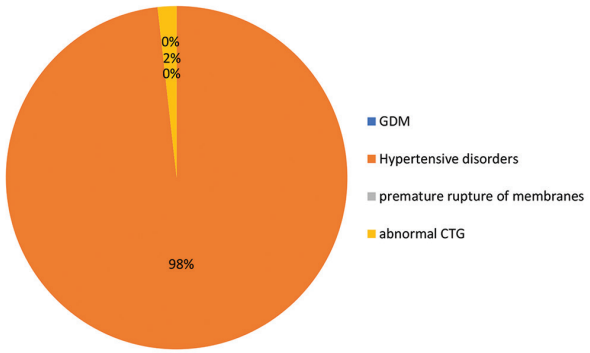

Table 3: Frequency distribution of study participants by background characteristics - IHCP allied

Background characteristics	*n* (%)
Gestational age at diagnosis IHCP (Weeks)	
28–31.6	0
32–36.6	4 (66.6)
37–39.6	2 (33.3)
>40 weeks	0
H/o IHCP in previous pregnancy	
No	5 (83)
Yes	1 (16.6)
Family history of IHCP	0

A history of ICP in previous pregnancies and a family history of IHCP are less commonly reported in the study sample Table 3.

In terms of treatment, the use of UDCA is predominant, with the 300-BD dosage being the most common,

Further, among study participants with intrahepatic cholestasis of pregnancy being treated with UDCA, experienced relief of symptoms within 1 week (66.6%) 33% reported symptom relief between 1 and 2 weeks Table 4.

The percentage of normal deliveries (83%) encountered was more as compared to LSCS or operative deliveries and post-partum hemorrhage was observed in (66%).

More cases of meconium-stained liquor were noted, no fetal death, fetal growth restriction or neonatal intensive care unit (NICU) admission noted.

LFTs

Serum bile acids	*n* (%)
<10 µmoL/L	1 (16.6)
10–40	5 (83.3)
40–100	0
>100	0
SGOT	
40–100 IU/L	5 (83.3)
100–200 IU/L	1 (16.6)
<200 IU/L	0
SGPT	
40–100 IU/L	6 (100)
100–200 IU/L	0
>200 IU/L	0

SGOT: Serum glutamate oxaloacetate transaminase, SGPT: Serum glutamate pyruvate transaminase

Most common range of serum bile acids were 10–40 µmoL/L (83%).

DISCUSSION

The incidence of IHCP in the Indian population is 0.02–2.4% and our study showed 0.35% consistent with Fathima *et al*. study.[2]

In the present research, we have explored the intricate relationship between LFT abnormalities and feto-maternal outcomes in cases of intrahepatic cholestasis of pregnancy (ICP).

Our objectives were threefold: To correlate LFTs and serum bile acid levels with ICP, to assess their effect on maternal morbidity and pregnancy outcomes, and to understand the perinatal morbidity and mortality associated with.

Our findings have shed light on significant correlations that not only align with existing literature but also provide novel insights into the clinical management of this condition.

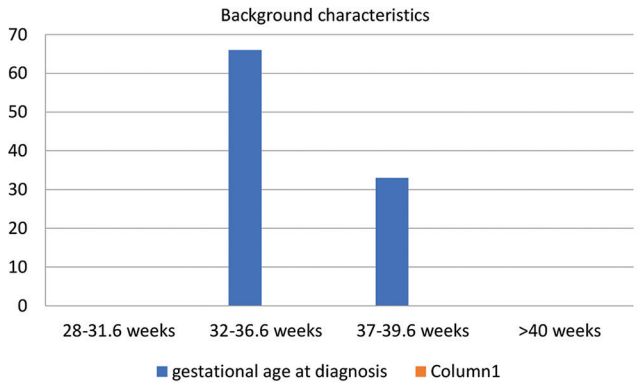

Table 4: Frequency distribution of study participants by background characteristics - UDCA treatment

Background characteristics	*n* (%)
UDCA	
150-TDS	2 (33.3)
300-BD	4 (66.6)
Onset of relief	
Within 1 week	4 (66.6)
1–2 weeks	2 (33.3)
More than 2 weeks	0

UDCA: Ursodeoxycholic acid

The percentage of primigravida was found to be (68.6%) in our study as compared to the study of Kant *et al*. was found to be (79%), which was close to the percentage in our study.[3]

In our study, the maximum percentage of age group was noted between 26 and 30 years of age (47.1%) which was found close to the percentage noted in Gupta *et al*. study, which was (66%).[9]

83% cases of mild IHCP were recorded in our study which was consistent with Jhirwal *et al*. study where mild IHCP (83%) was noted.[10]

The treatment with UDCA 300-BD provided relief to (72.9%) of patients within a week in Gupta *et al*. study which was consistent with our study where 75% of patients received relief.[9]

In our study, 66% of patients had meconium staining of liquor which was comparatively higher than Jhirwal *et al*. where 12.5% was noted.[10]

Fetal death was not seen in our study which resonated with Kant *et al*. study.[3]

Which is in line with our observation of increased bile acid levels in the later gestational period (37–39.6 weeks) Table 5.

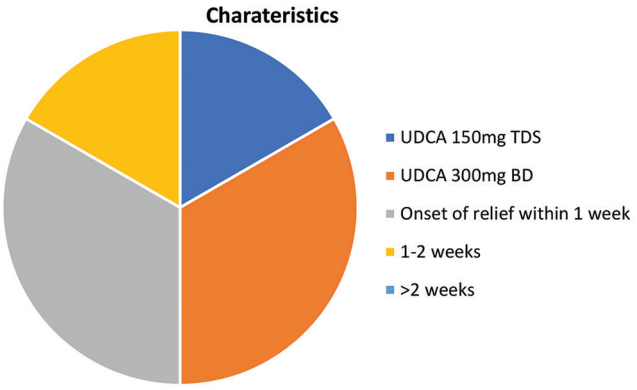

Table 5: Frequency distribution of study participants by background characteristics - maternal outcomes

Background characteristics	*n* (%)
Gestational age at delivery	No.
28–31.6	0
32–36.6	3 (50)
37–39.6	3 (50)
≥40	0
Mode of delivery	No.
Normal vaginal delivery	5 (83.3)
LSCS	1 (16.6)
Assisted vaginal delivery	0
Post-partum hemorrhage	No.
No	4 (66.6)
Yes	2 (33.3)

Table 6: Frequency distribution of study participants by background characteristics - fetal outcomes

Background characteristics	n (%)
APGAR <7 at birth	No 5 (83.3)
	Yes 1 (16.6)
APGAR <7 at 5 min	No 6 (100)
	Yes 0
NICU admission	No 4 (66)
	Yes 2 (33.3)
Fetal growth restriction	No 6 (100)
	Yes 0
Meconium stained liquor	No 2 (33.3)
	Yes 4 (66)
Fetal death	No 6 (100)
	Yes 0

NICU: Neonatal intensive care unit

Elevated bile acids, a hallmark of ICP, have been implicated in various adverse outcomes. Bile acids are known to play a critical role in fetal development and maternal health. When their levels rise, as evidenced in our study, they can induce oxidative stress and inflammation in the liver, leading to cellular damage. This mechanism aligns with the findings of Geenes and Williamson (2004),[11] which suggested that elevated bile acids can disrupt the normal physiological functions of the liver, thereby contributing to the pathogenesis of ICP.

The incidence and demographics of ICP in our study, primarily diagnosed in the third trimester and notably among primiparous women, resonate with the findings of and the incidence rates reported by Jhirwal *et al*. (2022).[10]

Our study also established that in most of the subjects, symptoms disappear after delivery or within 1 week of delivery.

CONCLUSION AND SUMMARY

Summary

Intrahepatic cholestasis of pregnancy (ICP) is the foremost liver disorder in pregnancies, presenting substantial risks and complications to maternal and fetal health. Characterized by symptoms, such as pruritus and elevated bile acids and Serum transaminases.

The study focuses on profiling 6 patients of ICP, evaluating the impact of UDCA treatment, and understanding the correlations between LFTs with Serum bile acid and various maternal and treatment factors, to improve surveillance and intervention.

The study identified a predominance of primigravida (83%) women of 26–30 years of age (66%), often needing hormonal support (33%), with maximum patient with moderate serum bile acid levels. IHCP diagnosis was commonly noted between 32 and 36.6 weeks GA (66%). The treatment with UDCA 300-BD (66%) was notably effective, providing relief to about 66% of participants within a week. Most deliveries occurred between 37 and 39 weeks (70%) GA, predominantly through, vaginal deliveries (83%). Post-partum hemorrhage was seen in patients. Fetal outcomes revealed a 66% incidence of meconium-stained liquor and about 33% NICU admissions with no fetal mortality Table 6.

The study emphasizes the importance of monitoring serum bile acid levels due to their direct correlation with adverse maternal and fetal outcomes, advocating for enhanced surveillance and timely interventions. It provides a comprehensive understanding of ICP, the efficacy of UDCA treatment, and the critical role of liver function monitoring in improving outcomes. The findings pave the way for future research and clinical practices, aiming to optimize ICP management for safer pregnancies and healthier feto-maternal outcomes.

Conclusion

The research presented in this study offers a comprehensive examination of the correlation between LFTs and feto-maternal outcomes in intrahepatic cholestasis of pregnancy (ICP). Thorough meticulous analysis and interpretation, this study illuminates the critical role of LFTs, specifically serum bile acid, serum glutamate oxaloacetate transaminase, and serum glutamate pyruvate transaminase levels, in predicting and managing the complexities of ICP.

The study found a significant association between elevated LFTs and various adverse maternal and fetal outcomes, including the necessity for surgical intervention in delivery, the presence of meconium-stained liquor indicating fetal distress, and poor/lower APGAR scores signifying immediate neonatal care requirements.

The findings advocate for a proactive and individualized approach to managing ICP, emphasizing the need for regular LFT monitoring and tailored care plans. The study highlights the potential of LFTs to serve as valuable indicators for clinical decision-making, from determining the mode of delivery to preparing for potential neonatal intensive care.

In conclusion, this research underscores the complex interplay between maternal liver function and feto-maternal health in ICP.

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CASE REPORT

A Case of Glanzmann Thrombasthenia

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ABSTRACT

Glanzmann thrombasthenia (GT) is a rare congenital autosomal recessive platelet function disorder characterized by defective platelet aggregation due to abnormalities in the glycoprotein IIb/IIIa complex. Clinically, it presents with mucocutaneous bleeding, including epistaxis, gingival bleeding, and easy bruising.

Key words: Glanzmann thrombasthenia, epistaxis and gingival

INTRODUCTION

Glanzmann thrombasthenia is a rare congenital autosomal recessive disorder.

Clinical features include bleeding manifestations such as epistaxis, gingival, and mucocutaneous bleeds.

CASE REPORT

A 1-year-old male citizen of Pune who is the second kid of a non-consanguineous marriage brought by parents with recurrent bouts of spontaneous nasal bleeding when he was quite small. There is a previous history of receiving numerous blood transfusions. The bleeding symptoms did not correlate with any prior history of bruises, hematemesis, gingival bleeding, trauma, or purpura. There is no significant family history or birth history. The patient is immunized for age and is developmentally normal.

Anthropometrically, weight for height was −1 to −2 standard deviation, which was normal.

At each episode of nasal bleeding, anterior nasal packing was done, and blood transfusion was given.

On examination, vitals were stable and pallor was present.

On per abdomen, palpation of hepatomegaly was seen.

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Laboratory Investigations

A peripheral blood smear revealed anisopoikilocytosis, primarily normocytic normochromic red bold cells (RBCs), a small number of microcytic hypochromic RBCs, a few teardrop and pencil cells, and an appropriate platelet count and size, along with a hemoglobin of 7.4 g%.

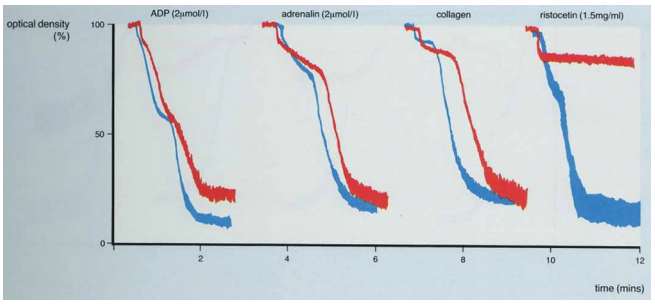
ENT opinion was taken. And an X-ray (paranasal sinus) was done, which was normal.

Prothrombin time showed 11.8 s (10–13), and

aPTT = 28.4 (31.1), which was normal.

Prolonged bleeding time was seen at 6 min 20 s (2–5 s).

Subsequently, platelet function disorder was suspected, and a platelet function test revealed aggregation with ristocetin only.



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Differential Diagnosis

Bernard Soulier

Von Willebrand Disease

Treatment

Patient education and immunization

- Platelet transfusions
- Symptomatic treatment.

Available treatment options

- Anti-fibrolytic therapy such as tranexamic acid and epsilon aminocaproic acid
- Recombinant factor VIIa
- Rituximab (antiCD20), bevacizumab – use of systemic corticosteroids, cyclophosphamide, azathioprine, plasmapheresis, IVIG
- Hematopoietic stem cell transplant.

DISCUSSION

With normal-sized platelets and morphologic characteristics on peripheral blood smears, Glansmann thrombasthenia is a platelet condition characterized by significantly abnormal bleeding time or PfA-100 closure times. All agonists except ristocetin, which does not require metabolically active platelets, elicit aberrant or absent aggregation in aggregation tests. In this syndrome, there is a deficiency in the platelet fibrinogen receptor 2b3a, the major integrin complex on the platelet surface.

The main integrin complex changes form in response to inside-out signaling that occurs during platelet stimulation. When a platelet is stimulated, fibrinogen binds to this complex, causing the platelets to coalesce. Gene mutations that can be identified and that are inherited autosomally recessively produce Glansmann thrombasthenia. Stem cell transplants have been used in curative therapy, according to reports.[1,2]

CONCLUSION

Glanzmann thrombasthenia should be considered as a rare possibility in patients presenting with recurrent epistaxis.

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CASE REPORT

Case of a Floppy Infant: Contiguous Gene Syndrome

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ABSTRACT

Case of a 29-day-old male baby having hypotonia and respiratory distress, which on further evaluation came to be diagnosed as contiguous gene syndrome (15q11–13 gene deletion).

Key words: Hypotonia, malformations, genetic or metabolic disorders

INTRODUCTION

Hypotonia is characterized by unusually low muscle tone or diminished resistance to passive, quick movements. It can be caused by various factors affecting central neural function, such as brain injuries, malformations, genetic or metabolic disorders, trauma, anatomical issues, or unknown (idiopathic) reasons. Central hypotonia can be widespread, affecting the limbs, trunk, and neck, or it can be localized, where some areas of the body exhibit low muscle tone whereas others may have normal or increased tone.[1]

CASE REPORT

A 29-day-old male baby came with complaints of hypotonia and respiratory distress. Birth history – full term, cesarean section delivery (i/v/o uteroplacental insufficiency) with a birth weight of 1.8 kg, and required resuscitation at birth. Physical examination – stridor, weak cry, generalized hypotonia. Systemic examination – suprasternal, sub-xiphoid, subcostal retractions, and bilateral crepitations. On admission, taken on continuous positive airway pressure. Started on orogastric tube feeds, continued for 15 days. Special investigations were done, which were as follows: Total leucocyte count – 14,300/L, Sr. Calcium – 9.3 mg/dL, Sr. Sodium – 131 mmoL/L, Sr. Potassium – 4.6 MmoL/L. Electroencephalogram – right frontocentral and frontotemporal epileptiform activity whole exome sequencing-deletion, overlaps with 15q11.2–q13 microdeletion corresponding to Angelman syndrome.

RESULTS

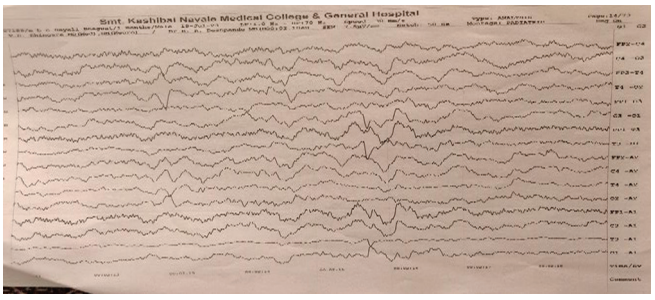
LIKELY PATHOGENIC COPY NUMBER VARIANT CAUSATIVE OF THE REPORTED PHENOTYPE WAS DETECTED

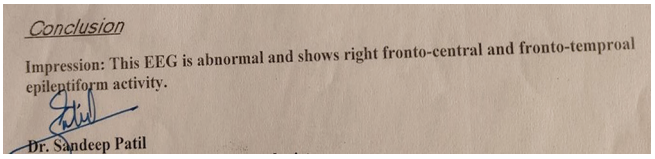
SNV(s)/INDELS

No significant SNV(s)/INDELS for the given clinical indications that warrants to be reported were detected.

Copy Number Variants CNV(s)

Variant	Zygosity	Size (KB)	Disease (OMIM)	Inheritance	Classification[5]
chr15:g.(?_23447098)_(28299516_?)del	Heterozygous	4852.42	-	-	Likely Pathogenic





The baby was discharged on oral feeds with weight gain and no respiratory support.

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DISCUSSION

Three distinct neurodevelopmental disorders are primarily associated with deletions or duplications at the 15q11–q13 locus: Prader–Willi syndrome, Angelman syndrome, and 15q11–q13 duplication syndrome.[2] Angelman syndrome is characterized by developmental delays, intellectual disability, lack of speech, seizures, an unsteady gait, a cheerful demeanor, and distinctive facial features. Management typically involves speech, occupational, and physical therapy, along with dietary and nutritional support, and ophthalmologic evaluations for conditions such as strabismus and hemianopia. Family counseling is recommended.

CONCLUSION

Contiguous gene syndrome (15q11–13 gene deletion) is a rare cause of hypotonia presenting early in life.

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CASE REPORT

Orofacial Granulomatosis Masquerading as Borderline Tuberculoid Leprosy – A Rare Case Report

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ABSTRACT

Orofacial granulomatous disease is characterized by non-necrotizing granulomatous inflammation of the oral and maxillofacial region. Clinical findings include labial inflammation, perioral and mucosal inflammation, mouth ulcers, and gingivitis. Leprosy is a chronic, granulomatous, and multisystem disease and the involvement of lips is an extremely rare entity that can be mistaken for a variety of other granulomatous conditions. Hence, histopathological examination is necessary in such a case scenario to overcome the challenges that a professional has to face. Herein, we report a patient who presented with chronic asymptomatic swelling of the left cheek and upper lip which was later histopathologically confirmed to be a case of orofacial granulomatosis.

Key words: Orofacial granulomatosis, Crohn's disease and sarcoidosis

INTRODUCTION

Orofacial granulomatosis is a rare chronic inflammatory condition characterized by swelling of lips, histopathologically presence of non-caseating granulomas, and absence of any recognized systemic conditions such as Crohn's disease and sarcoidosis.[1] Leprosy is a granulomatous disease affecting the skin and peripheral nerves, caused by Mycobacterium leprae. Involvement of lips is an extremely rare entity and can be mistaken for a variety of other granulomatous conditions. It can cause significant cosmetic and functional problems but can be prevented if diagnosed early and treated promptly.

CASE REPORT

A 56-year-old woman presented to our hospital with asymptomatic swelling over the upper lips and left cheek for the past 2 years [Figure 1]. The lesions had a waxing and waning course. The patient did not give any history of skin lesions, loss of sensation, insect bite, chronic lip biting and trauma. There was no history of any comorbidities. There was no history of similar complaints in the family members. She was diagnosed as a case of borderline tuberculoid leprosy by a private practitioner and treated for the same with multibacillary multidrug therapy for a period of 1 year but did not show any improvement.

On examination, there was diffuse, non-tender, firm, and erythematous swelling present over the left cheek and upper lip. The patient was evaluated further and investigations like a slit-skin smear were done in which no acid-fast bacilli was seen. A nerve conduction test was done which was normal.

A skin punch biopsy from the left cheek was taken. The biopsy shows flattened epidermis, dense nodular, and granulomatous infiltrate distributed in the superficial and

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mid dermis. Granulomas consist of dense lymphocytic rim with central epithelioid macrophages and giant cells with few intralymphatic nodular granulomas. Granulomas are surrounding the nerves and appendages, however not infiltrating the nerves. The special stain for acid-fast bacilli was negative. The histopathological findings were suggestive of orofacial granulomatosis.

The patient was treated with drugs, such as leflunomide 20 mg twice daily and tapered to 10 mg daily, metronidazole 400 mg 3 times a day, and hydroxychloroquine 200 mg daily and tapering doses of systemic corticosteroids for a period of 4 months after, which she showed considerable improvement in swelling and consistency of lesion [Figure 2].

DISCUSSION

Wiesenfeld *et al*. introduced the term orofacial granuloma[2] to describe the formation of granulomas in the orofacial region in the absence of recognized disease. Although the antibiotics that trigger the immune system vary from patient to patient, delayed-type hypersensitivity plays an important role. The exact cause of orofacial granulomatous disease is unknown. Genetics, allergies (food, dental products), microbiology, or the immune system are considered possible causes.[3] It is caused by a random influx of inflammatory cells such as cytokines, chemokines, and chemokine receptors.

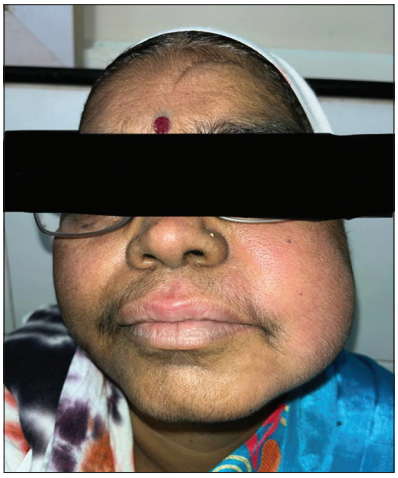

Figure 1: Clinical image at the time of presentation

Orofacial granulomatosis clinically presents with:

Labial swelling: A persistent, recurring lip swelling that eventually develops into a permanent, painless, and rubbery tissue-like mass due to lymphatic involvement by inflammatory granulomas.[4]

Oral ulcers: The most common type is deep-seated chronic ulcers with wide erythematous margins and slightly raised surroundings occurring usually in the vestibule. Less common type of ulcers are superficial aphthous-like ulcer and superficial erosions on the gingiva, vestibule, or soft palate.[5]

Inflammation of the mucous membranes causes a "cobblestone" appearance.

Mucosal tags: Mucosal tags are present in vestibules or retromolar region which is painless.

Gingival inflammation: Painless inflammation of free or attached gums occurring locally or in generalized form.[5]

Facial palsy: A lower motor neuron palsy of the facial nerve can occur rarely.

After a period of recurrence, lip swelling may become severe and persistent, causing serious problems and affecting speech and eating. The diagnosis of orofacial granulomatous disease depends on the presence of orofacial clinical findings, histopathological evaluation of non-caseating granulomatous inflammation, [Figure 3] and exclusion of systemic

Table 1: Differential diagnoses of Orofacial Granulomatosis (OFG) and distinguishing clinical features

Diseases	Features different to ORO facial granulomatosis [OFG]
Crohn's disease	The orofacial features are identical, although oro-cutaneous fistulas may occur. Patients most commonly have ileal or rectal or oral disease.
Sarcoidosis	Pulmonary, cutaneous, lacrimal, salivary, neurological, and skeletal features of sarcoidosis may also be present in affected patients..
Allergic angioedema	Manifests as non-pitting edema of lips, tongue, pharynx, face. Patients may have a history of atopic disease along with some identifiable precipitants
Tuberculosis	Rarely affects lips in immigrant groups and HIV-infected individuals. It manifests as localized swelling and ulcers. Usually contains caseating granuloma
Miescher's cheilitis (Schuemann's granulomatous cheilitis)	Manifests as labial enlargement and has histopathology contains non-caseating granuloma
Melkersson-Rosenthal syndrome	Manifests such as labial enlargement, fissuring of the tongue, and lower motor neuron facial nerve palsy

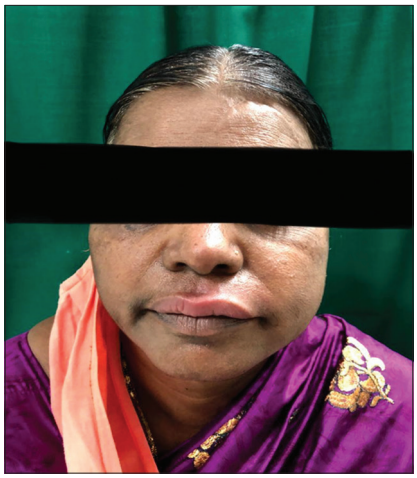

Figure 2: Clinical image after 4 months of treatment

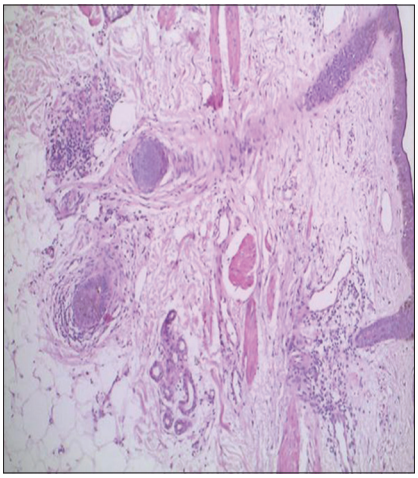

Figure 3: Histopathological image showing non-caseating granuloma

disease that causes similar findings, including many of the granulomatous diseases listed in the Table 1 below.[1]

Remission of orofacial granulomatosis is rare, and treatment of the patient's symptoms remains unprofitable, especially when diagnosis is delayed. Corticosteroids are considered the mainstay of treatment.[6] Systemic corticosteroids and immunosuppressant, anti-tumor necrosis factor agents, such as thalidomide, infliximab, and adalimumab, clofazimine as well as surgical cheiloplasty, and low-level laser therapy have been used as single or combined therapy.[6] Intralesional corticosteroids may cause improvement in some but not all patients. Other medications such as methotrexate, minocycline, metronidazole, hydroxychloroquine, as well as psychological support and counseling may help improve quality of life.

CONCLUSION

It is difficult to diagnose orofacial granulomatosis due to its different clinical manifestations and rarity. It can be confused with lepra reactions as both can present with labial swelling. Local and systemic conditions characterized by granulomatous inflammation must be excluded by appropriate clinical and laboratory investigations. Thus, the diagnosis depends on the correlation between clinical and histopathological findings.

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