

Surrogacy Unveiled: Doctors Experience and Stories of Hope and Challenges



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ABSTRACT

Objective

To focus on the experiences of doctor's, intending parents, and surrogates with beautiful surrogate babies, including legal issues and the challenges posed by the pandemic.

Study Design

This study adopts a novel strategy by investigating surrogacy from a medical professional's viewpoint. We want to offer our knowledge and wisdom gained from dealing with surrogacy as a doctor, especially in light of the many challenges brought on, including the COVID-19 pandemic. The purpose of this study is to comprehend the role of the doctor in surrogacy and how it relates to intended parents' and surrogate moms' experiences.

Subjects

This study's subjects include the doctor, who is also its principal investigator, as well as intending couple and surrogate mother. While intending parents and surrogate moms contribute further insights into their involvement in the surrogacy process, the doctor's experiences serve as the central narrative.

Main Outcome Measures

In this study we have looked into indications, neonatal outcomes, legal aspects, in house development, management during covid 19 pandemic of all surrogates through our experience at a single center over 5 years.

Results

This study provides insight into the experiences of couples considering surrogacy, the effective management of surrogates during a pandemic, and the impact of surrogacy on the developmental outcomes of children.

Conclusions

The findings highlight the experiences of intending couples during the challenging period of the COVID-19 pandemic, emphasizing prolonged separations, varying perceptions of baby development, and increased anxiety. The successful handling of surrogates

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in this context, where 19 out of 54 tested positive for COVID-19 but all recovered, underscores the adaptability and success of established protocols. Additionally, the positive developmental progress in children and the prevalence of donor eggs in surrogacy outcomes contribute to a comprehensive understanding of surrogacy. Overall, this study sheds light on the emotional, physiological, and developmental aspects of surrogacy.

KEYWORDS: Legal, Foreign Surrogacy, Intending parents, Infertility.

MANUSCRIPT

Introduction

The term "surrogate" is derived from the Latin word "Subrogare," signifying "to substitute," suggesting an individual appointed to act in the place of another. In this context, a surrogate mother is a woman who becomes pregnant and carries a child with the intention of relinquishing the child to another person or couple, often known as the "intended" or "commissioning"

parents. Surrogacy is an essential fertility treatment, particularly for women unable to conceive due to the absence of a uterus, uterine anomalies, severe medical conditions, or other reasons prohibiting pregnancy. It allows these individuals to achieve motherhood by using an embryo created by themselves or using gametes from a donor, which is then transferred to the uterus of a gestational carrier. Furthermore, this technique facilitates gay couples and single men to attain fatherhood by creating an embryo with their sperm and donor oocytes.^[2]

Countries	Legal Status
South Africa	Altruistic surrogacy is allowed only for residents, with no financial rewards for surrogate mothers. beyond pregnancy-related expenses.
Nigeria	Lack of legal framework for surrogacy in Nigeria. Practice tolerated in certain regions. Questionable legitimacy due to absence of laws or judicial rulings.
Japan	Absence of surrogacy legislation. Use of guidelines and legal opinions. Societal and cultural factors contribute to stigmatization and discouragement.
Thailand	Exclusive allowance for opposite-sex married couples. Requirement for couples to be Thai residents. Limited to commercial surrogacy contract arrangements.
China	Illegal, yet widespread and tolerated.
India	Altruistic surrogacy is legal.
Israel	Legal with state approval.
Australia	Altruistic surrogacy legality across jurisdictions except Northern Territory. Commercial surrogacy classified as a criminal offense.
Canada	Altruistic surrogacy is legal.
United States	Lack of federal surrogacy law in the United States. Varied regulations at the state level.

Table-1. Status of surrogacy of some countries ^[4]

Over the past two decades, this decision opened the doors for Indian citizens and international singles or couples from various corners of the world to explore various assisted reproductive technologies, including egg donation, in vitro fertilization (IVF), and surrogacy. This legal framework laid the foundation for India's growing role in the global surrogacy industry. Then, on January 23, 2022, the Surrogacy Act came into effect, bringing with it a new set of regulations and guidelines governing surrogacy arrangements in the country. These changes marked an important development in the field of surrogacy in India.^[3]

Surrogacy can be categorized into two types: traditional and gestational. Traditional surrogacy involves artificial insemination with the intended father's sperm, making the surrogate mother a genetic parent along with the intended father. In contrast, gestational surrogacy, also known as host surrogacy, entails transferring an embryo from the intended parents or using donated gametes to the surrogate's uterus. In gestational surrogacy, the woman carrying the child has no genetic connection to the baby.

Additionally, surrogacy arrangements fall into two broad categories: commercial and altruistic. Commercial surrogacy involves monetary compensation for the surrogate mother's services, while altruistic surrogacy only allows reimbursement for medical and pregnancy-related expenses, along with insurance coverage^[2].

Within the realm of assisted reproductive technologies and surrogacy, the concept of "in-house surrogacy" has gained recognition. This innovative approach entails the surrogate mothers voluntarily residing within the hospital premises during the pregnancy and birthing process. It offers benefits such as enhanced medical supervision, medical and emotional support, reduced travel, increased accessibility, personalized pregnancy care, minimized legal and ethical concerns, family-centered care, comprehensive birth and postpartum care, improved psychological well-being, and optimized birth planning.

Foreign Surrogacy

Countries where gestational, commercial, and international surrogacy are legal include Russia, Ukraine, Greece, the UK, and Iran. We have delivered nearly 383 babies for foreign couples.

Commercial surrogacy was permitted in India for foreigners starting in 2002. Foreigners have traditionally found India to be a welcoming and satisfying destination for surrogacy. Our hospital has hosted individuals from over 48 different countries who sought surrogacy services here. The happiness and contentment of these individuals were palpable, so much so that some of them chose to give Indian names

to their children born through surrogacy like Krishna, India, Arjun, Ram, Anand, etc. Their satisfaction extended beyond the birth, as many of them continue to support the surrogates who played a vital role in this journey by sponsoring their children's education and providing essential needs. We also maintain connections with our patients, with some of them sharing photos of their surrogacy-born babies and updating us on the children's well-being.

However, with provisions in the draft ART Bill of 2014 and a notification from the Health Ministry of India on November 3, 2015, surrogacy became prohibited for foreign nationals, including OCIs and PIOs.^[8]

Indication of surrogacy

When a pregnancy is confirmed in the gestational carrier, she may either stay at the surrogate house or at her own home, depending on the surrogate's choice. The concept of the surrogate house has garnered significant attention in recent times due to various factors. It was established to address the wishes of many surrogates who seek shelter during their pregnancy. This need arises because many surrogates wish to keep their surrogacy confidential from friends and family, especially in rural areas where there may be a lack of awareness about the scientific procedures involved in surrogacy.

The surrogate house serves as a residence for the surrogate throughout her entire antenatal period, up to the delivery date, providing for all her medical and personal needs. Given the importance of the pregnancy, the obstetric care provided to surrogates is comprehensive.

In the surrogate house at our center, surrogates are under the 24-hour supervision of nursing staff, along with a team of professionals, including a dietician, physiotherapist, counselors, and gynecologist, to ensure their medical well-being. Surrogates receive ample rest and nutritionally complete meals, which are essential for their health during pregnancy. Being under one roof, they offer each other significant emotional, moral, and psychological support. Surrogates can also meet with their families and children and stay in constant contact with them via phone. They have the flexibility to return to their homes as they wish. Furthermore, young children of surrogates can stay with them at the surrogate house during weekends and school holidays. Staying at the surrogate house is voluntary, and any surrogate wishing to stay at her own home can do so. Activities in the surrogate houses included language lessons in Gujarati, Hindi, and English for the surrogates and their children. There were also enrolled for sewing classes, lessons on pregnancy rituals, beautician courses, and creative activities such as clay

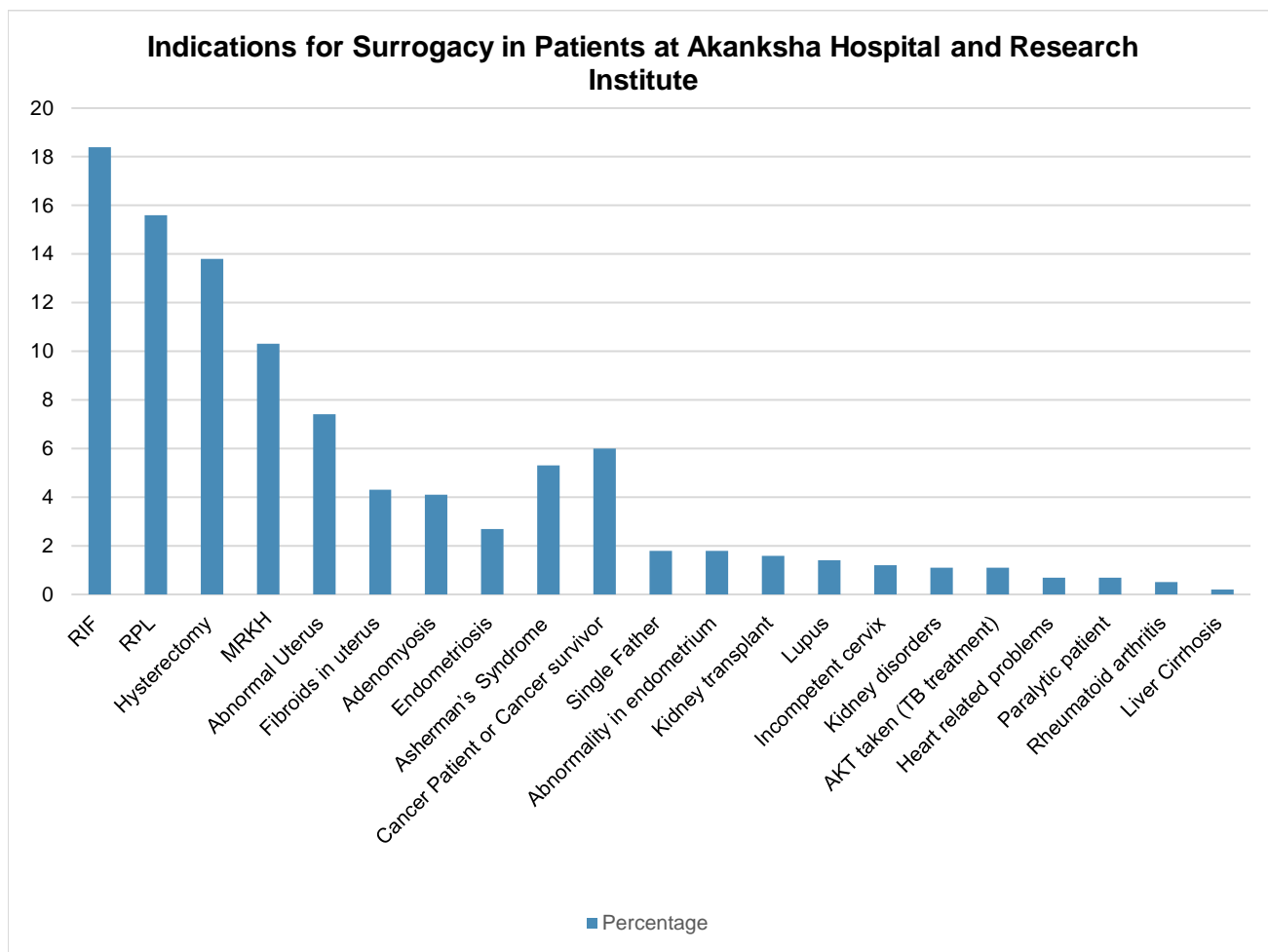


Fig-1 Represents indication for surrogacy

modeling and paper work. Additionally, yoga and exercise classes were provided to promote the health and well-being of the surrogates.

While at the surrogate house, the surrogate undergoes obstetrics assessments every 14 to 20 days until the delivery date. Obstetric scans are performed at various intervals: at 6–8 weeks, 11–13 weeks for an anomaly scan, at 20–22 weeks for a 3D–4D anomaly scan, at 28 weeks, and at 34–36 weeks for a growth scan. Any additional scans are conducted based on the obstetrics requirements. Regular updates about the surrogate's pregnancy, such as weight gain, vitals, fetal growth, antenatal investigation reports, and scans, are sent to the intended couple via e-mail.

After delivery, the surrogate is observed for a minimum of 15 days before being discharged. Her medical tests including repeat haemogram is done and she is also provided with a post partum rehabilitation kit comprising of sanitary pads, abdominal belt, haematinics and calcium tablets.

Practical Problems

The arrangement of surrogacy, being a third party method of reproduction, is a delicate one. In our experience, while majority of the cases have been uneventful and smooth, there are a few pinpointable special cases which need to be discussed. These have in-turn enhanced our learning curve in surrogacy.

Legal Issues

1. *Baby Manji Yamada vs Union of India.*

The biological parents Dr. Yuki Yamada and Dr. Ikufumi Yamada came to India from Japan in 2007 and commissioned surrogacy at Akanksha Hospital Anand, Gujarat. After transfer of their embryo into the surrogate, the mother left India due to marital discord and the couple was divorced before the baby was born. The father had to leave India as his visa was expiring and his mother stayed in Anand to take care of the baby. The baby was issued a birth certificate with her biological father's name in it. However, the baby had to be shifted to Rajasthan due to a law and order situation in Gujarat. A writ petition was filed by an NGO M/s SATYA before the High Court of Rajasthan, Jaipur

Bench against Union of India and State of Rajasthan. The writ petition challenged surrogacy and criticised it as feeding an illegal industry in India and need for the enactment of a law. The division bench passed an order to produce the child before the court. This order was challenged by the grandmother on behalf of the baby in the Supreme Court of India. A two judge bench gave the following judgement: Surrogacy is a well-known method of reproduction and elaborated on various forms of surrogacy; the petition made by the NGO Satya was not in good faith and certainly not in public interest. In the present case if any action has to be taken, it has to be the Commission constituted under Commissions for Protection of Child Rights Act, 2005. It also stated that till then no complaint had been made by anybody relating to the child and hence the writ petition was disposed with a direction that if any person has any grievance, the same can be ventilated before the Commission constituted under the Act. Also, Learned Solicitor General, stated that upon submission of relevant application, request for extension of visa for the grandmother and travel documents to the Baby shall be disposed of expeditiously. Subsequently, the regional passport office granted an 'identity certificate' to the baby and the baby flew to Japan on Japanese visa provided on humanitarian grounds. [6]

2. *Union of India vs Jan Balaz.*

This German couple was intending parents and had twin babies delivered in India through surrogacy. The birth certificate had the name of the genetic father and the surrogate mother as the parents. The father had problem getting travel document for the children and he moved the Gujarat High court which ordered for the babies to be provided with Indian passports. However, Indian Government refused to provide the children with Indian citizenship as they were born through surrogacy while the German authorities refused to grant them visa or citizenship as the state did not recognise surrogacy. Finally, the couple could go through inter-country adoption process supervised by Central Adoption Resources Agency (CARA) which took about two years for the couple to return to Germany with their children. [11]

3. *Grandmother became Surrogate mother.*

An Indian couple residing in the UK faced the challenge of finding a surrogate mother as the wife was born without a uterus. Faced with the husband's desire for a genetic child and the inability to find a suitable surrogate in Anand and India over three months, a unique solution emerged. The mother volunteered to be the surrogate for her daughter. After a 9 months, she successfully gave birth to twins, a boy and a girl, fulfilling the couple's dream of parenthood. [12,13]

The Impact of COVID-19

During the COVID-19 pandemic, India encountered an extraordinary rise in cases, prompting a nationwide lockdown from March 23 to May 30, 2020. Even after the formal cessation of the lockdown, numerous states, especially those identified as red or orange zones, sustained restrictions. These circumstances brought forth substantial challenges for intending couples trying to reach the hospital to be with their newborns.

Consequently, Akanksha Hospital and Research Institute witnessed a significant number of 46 babies admitted in the Neonatal Intensive Care Unit (NICU) during this period. The challenges faced by intending parents revolved around travel restrictions, limited accessibility due to zone designations, and the general apprehension regarding the health risks associated with the pandemic.

The hospitals infection control committee laid down strict protocols to contain all the in-house surrogates and their children in a covid free bubble. Surrogates were restricted from meeting their husbands and other relatives. They were also educated about infection control practices such as handwashing and masking up.

These stringent protocols and regulations posed constraints on the intending parents' visitation rights and interactions with their newborns. These limitations complicated the emotional and psychological well-being of the parents and affected their ability to bond with the newborns and the surrogate mothers. The situation raised notable concerns about the emotional connection, parental rights, and the mental health of both the parents and the surrogate infants during this crucial period. Such challenges emphasized the need for enhanced support systems and innovative measures to mitigate the impact of similar health crises on the intending parents and the surrogacy process.

The doctors attending the surrogates were constantly involved in counselling and reassuring the intended parents on the wellbeing of their surrogate. This situation was one of a kind, as even for the doctors, as all intended parents and the relative of the surrogates, had given the responsibility entirely to the treating doctors for the overall wellbeing of the surrogates and their unborn babies. This led to a lot of mental pressure on part of doctors.

During the COVID-19 pandemic, our hospital encountered several challenges. The first instance was when a surrogate, after visiting her home, tested positive for COVID-19. Following her diagnosis, she was transferred to isolation, but she refused to stay and returned to the hospital, leading to another surrogate contracting the virus. Both infected surrogates were

isolated within the hospital premises, receiving round-the-clock care from our staff nurses.

Subsequently, another surrogate who lived off-site was diagnosed with COVID-19 but declined to stay in the hospital's isolation ward. She and her husband requested a separate isolation house and 24-hour nurse assistance, which we provided. We conducted regular health check-ups and free COVID-19 tests for all surrogates. Daily phone calls from the families of surrogates and intending couples became a significant challenge, as their relatives tended to avoid hospital visits and entrusted the responsibility of the surrogates and their children to our hospital staff. We administered nebulizers three times a day, prepared Kadha (Ayurvedic Medicinal Drink), and provided homeopathic medicine to enhance their immune systems. Symptomatic cases were promptly tested for COVID-19.

We extended comprehensive care to the surrogate mothers' children while the newborns were under our supervision in the Neonatal Intensive Care Unit (NICU). Daily updates regarding the newborns' well-being and progress were consistently communicated to the intending couples. Our team diligently followed all precautionary measures by getting vaccinated, maintaining physical distance, wearing masks, frequent hand sanitization, and isolating individuals showing COVID-19 symptoms, ensuring the safety of all involved.

Materials and Methods

The realm of surrogacy and its various aspects explored in this research paper using a qualitative and retrospective study approach, with a focus on the perspective of a medical professional. The study is focused on the doctor's experiences with surrogacy and pays specific attention to the special difficulties brought on by the COVID-19 pandemic. The study also weaves together the individual accounts of intended parents and surrogate moms who both played crucial roles in the surrogacy process.

Data Collection

1. **Author's Experience:** The primary source of data is the author's extensive and multifaceted involvement in the field of surrogacy. As a medical practitioner specializing in reproductive medicine, the author has engaged in consultations, performed medical procedures, and witnessed the emotional journeys of surrogate mothers, intending parents, and newborns.
2. **Intending Parents and Surrogate Accounts:** To provide a more comprehensive perspective, this study incorporates firsthand accounts and

narratives generously shared by intending parents and surrogate mothers who have been integral to the surrogacy process. These narratives were gathered voluntarily to ensure that the voices of those who have experienced surrogacy are included.

In our research, we addressed four fundamental aspects

1. **COVID-19 Lockdown experience:** To gather pertinent data, we developed a structured Google Form questionnaire, which was distributed to intending parents. This questionnaire aimed to capture their experiences during the COVID-19 lockdown, with a primary focus on their encounters during the period of separation from their newborns and the challenges faced in connecting with the surrogate mother.
2. **Management of Surrogate Mothers with COVID-19:** We also examined our approach to managing cases involving surrogate mothers who tested positive for COVID-19.
3. **Retrospective observational study** has been carried out at Akanksha Hospital on date 20/03/2023 to evaluate impact of surrogacy on child's developmental mile stone. This study contained data of 38 children (Age group 3 year to 6 year) regarding impact of surrogacy on child's milestone development. Data were collected in the form of questionnaire by google form sheet which were filled by either child's parents or relatives. This questionnaire comprised of questions to assess early physical development i.e., gross/fine motor skill; personal/social communication skill; and some questionnaire of problem solving for assessment of general intelligent development.
4. **Neonatal Outcome of Surrogacy-** We had also conducted one study where we retrospectively analyzed 201 surrogate pregnancies and their respective births, leveraging data collected from hospital records and databases. The information encompassed details on surrogate pregnancies, birth outcomes, and the source of eggs (self or donor). Key parameters analyzed included the maturity at birth, birth weight, and classification of the egg source as either self-egg or donor-egg.

Results

COVID-19 Lockdown experience

The study also collected responses from parents who experienced the challenges posed by the COVID-

19 pandemic and its associated restrictions in their surrogacy journey. These responses shed light on various aspects of their experiences and emotions.

Duration of Separation

The duration of separation between parents and their newborns ranged widely, from as short as 5 days to as long as 2 months. These findings highlight the diverse experiences that parents faced, with some enduring more extended periods of separation.

Current Baby Development

Parents' assessments of their child's development varied. Some reported that their child's development exceeded expectations, while others described it as normal. Tragically, a car accident in which the couple with baby was travelling in one case resulted in head injury, with no developmental progress noted.

the afternoon with the couple to update about the baby's progress.

Emotions During Separation

The emotions experienced by parents during the separation period were multifaceted. The dominant emotions included anxiety, helplessness, and sadness. Other emotions such as frustration, fear of COVID-19, and relief were also reported. These findings reflect the complex and emotionally taxing nature of this period. Specially for those intended parents whose surrogates delivered in their absence and they missed the crucial moment of the birth of their baby.

The results provide valuable insights into the psychological impact of pandemic-related restrictions on intending parents, emphasizing the need for better support and coping mechanisms in similar circumstances.

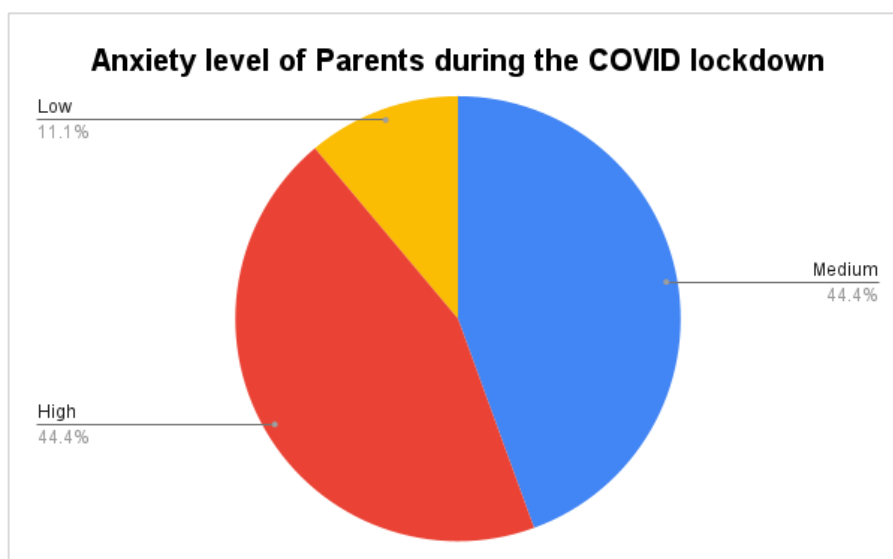


Fig-2 Represents the anxiety level of Parents during the Pandemic

Initial Anxiety Due to COVID-19 Restrictions

All participants reported feelings of anxiety upon learning about the COVID-19-related restrictions that would prevent them from being with their newborns. This suggests that the uncertainty and challenges brought about by the pandemic had a universal impact on their emotional well-being.

Communication During Separation

Communication patterns during the period of separation varied among parents. Some reported regular communication with their child, while others admitted to not communicating at all. This variability highlights the diverse strategies parents employed to stay connected with their newborns during this challenging time, the neonatal unit of Akanksha Hospital including the doctors had regular video calls in

Management of Surrogate Mothers with COVID-19

During the COVID-19 pandemic, our hospital accommodated 54 surrogates. Despite stringent precautions in place to minimize the risk of infection, a few surrogates tested positive for COVID-19. Out of the 54 surrogate mothers residing in our hospital, 19 tested positive for COVID-19, while 35 tested negative. However, it's important to note that all the surrogates successfully recovered from the virus without experiencing any adverse effects. Importantly, none of the newborns under our care tested positive for COVID-19.

Surrogacy's impact on a child's developmental milestones

Data interpreted that majority of the child found with normal developmental achievement of milestone. Among 38 children, 19 children were born in year 2017,

11 children were born in year 2018, 07 children were born in year 2019 and 1 child was born in year 2020.

Discussion

The varying durations of separation and diverse

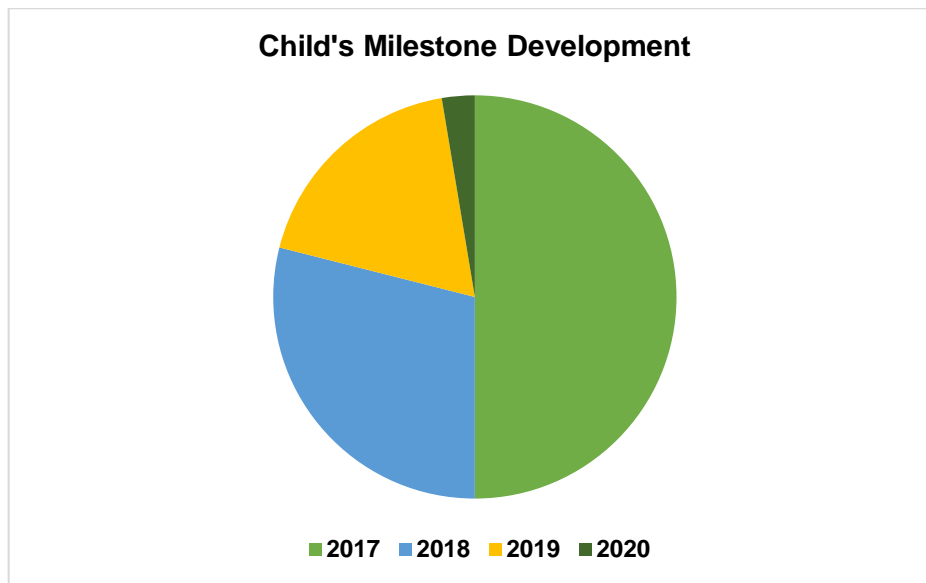


Fig-3 Represents the Development of child born through Surrogacy

Neonatal Outcome of Surrogacy

In our study involving 201 surrogate pregnancies, a total of 252 babies were born, consisting of 120 singleton births and 132 twin births, demonstrating variability in the outcomes of single and multiple births. The average birth weight for singleton babies was calculated at 2.161 kilograms, while twin babies exhibited a slightly lower average birth weight of 2.067 kilograms, indicating a discernible difference in birth weights between singleton and twin births. The analysis of the source of eggs used in the surrogacy process revealed that approximately 20.4% of the surrogate mothers contributed to the birth of children using intending parents' own eggs. The larger share, about 79.6% of births, was delivered from donor eggs. Women may seek the use of donor eggs for various reasons, encompassing factors such as poor egg quality, advanced maternal age leading to a decline in both the quality and quantity of eggs, conditions like Endometriosis or chocolate cyst, absent ovaries, and a history of repeated IVF failures. Furthermore, situations involving recurrent pregnancy loss or the absence of a uterus can also drive the necessity for utilizing donor eggs. Surrogacy is not typically considered as the initial option; it becomes a consideration after exhausting other possibilities, especially when a woman has attempted various options, and her age advances while the quality of her eggs declines. In such cases, surrogacy is pursued, providing an alternative for individuals facing these challenges and increasing the likelihood of a successful pregnancy.^[1]

emotions experienced by intending parents during surrogacy underscore the need for comprehensive support structures. The emotional impact of extended separations, differing child development outcomes, and universal anxiety highlight the importance of tailored coping strategies and enhanced support mechanisms. The results advocate for better policies, clinical guidelines, and improved emotional support within surrogacy procedures to aid intending parents during periods of enforced separation due to unforeseen circumstances.

The results indicate that despite comprehensive precautions implemented in the hospital, a few surrogates contracted COVID-19 during the pandemic. However, the positive outcome was that all affected surrogates effectively recovered without any apparent complications. It is notable that stringent measures in place might have contributed to the successful recovery and minimal impact on the surrogates' health. Equally significant was the absence of any newborns testing positive for COVID-19, affirming the efficacy of the hospital's preventative strategies in safeguarding the infants from the infection.

This success highlights the importance of robust healthcare protocols in controlling and managing infectious diseases, particularly in specialized settings like surrogacy hospitals. The outcomes of the study emphasize the critical role of preventive measures in minimizing risks and ensuring the safety of both surrogates and newborns.

It is critical to understand that the impact of surrogacy on milestone development is neither

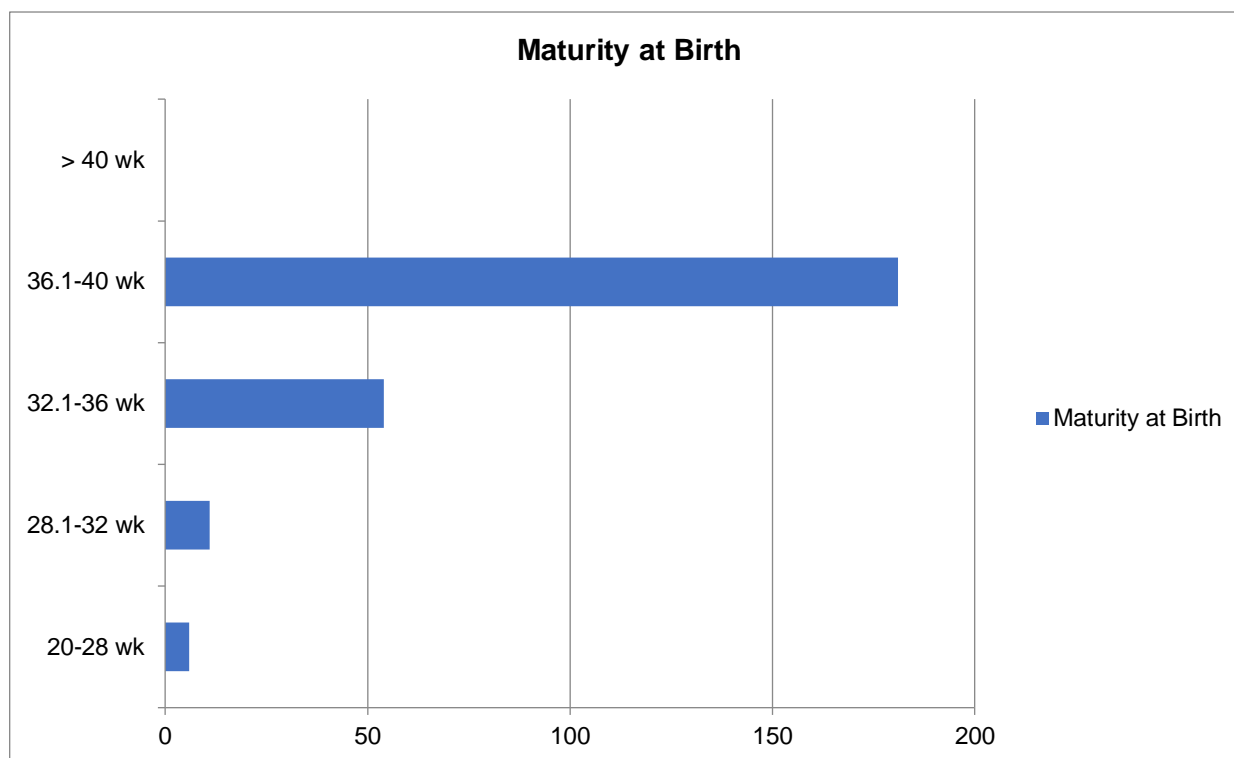


Fig 4- Indicates the weeks of maturity of the neonates at birth

detrimental nor favorable. It is determined by the family's attitude towards surrogacy, which includes open communication, emotional support, and the child's sense of belonging and acceptance within the family.

The most crucial part is that the child is reared in a loving, supporting, and communicative atmosphere in which their unique needs, questions, and concerns are recognized and handled as they develop and mature. Seeking expert advice and counselling can also be beneficial in supporting both parents and children as they negotiate the intricacies of surrogacy.

The analysis of 201 surrogate pregnancies revealed varying factors influencing birth outcomes. The study emphasized differences in maturity at birth, birth weight, and the source of eggs (self or donor). The majority of pregnancies derived from donor-egg sources, showing variations in average infant weight. The study highlights the need for further research to understand and enhance surrogate pregnancy management for optimal maternal and infant health outcomes.

This study is unique in its vast experience of the various aspects of surrogacy. In house surrogate dormitory gives us a lot of information about otherwise unexplored aspects of surrogacy.

As a hospital, we provide continued care to the surrogate and her family members, thereby leading to community building and empowering women around us.

A chapter authored by our team titled 'Exploring Social, Economic, and Emotional Aspects of Surrogacy Practice: A Retrospective Analysis of 106 Surrogate Mothers in Anand' was featured in *Red Biotechnology*. Focusing on a study conducted at a single center in Anand involving 106 surrogate mothers, this chapter delves into the various facets of surrogacy in India. It emphasizes the importance of considering the surrogate mothers' perspectives, asserting their significance as essential participants in the surrogacy process. The study's results indicate the potential positive impact of compensated surrogacy on the lives of the surrogates. Financial compensation provided through surrogacy contributes positively to the social well-being of these women, supporting their children's education. It concludes by suggesting that appropriately administered surrogacy can offer benefits to both the surrogate mothers and intended couples, enabling the former to enhance their future prospects while assisting the latter in realizing their family dreams.^[14]

Conclusions

The surrogacy procedure for needy couples is a boon, empowering surrogates and bringing beautiful

babies into this world. It creates happy families and connects families separated by miles, as there are no ethical, political, religious, or geographical barriers to it.

The study involving intending parents navigating surrogacy during the COVID-19 pandemic highlighted diverse experiences, including varying durations of separation and emotional complexities. Communication patterns differed, suggesting the need for tailored support mechanisms for intending parents in challenging circumstances.

Another study conducted during the pandemic revealed the successful recovery of surrogates who tested positive for COVID-19 and confirmed no virus transmission to newborns, indicating the efficacy of stringent hospital safety measures.

The studies emphasize the critical importance of providing a nurturing environment for children born through surrogacy, underlining the significance of

addressing their unique needs and providing necessary support for both parents and children.

Furthermore, the retrospective analysis of 201 surrogate pregnancies showed significant variances in birth outcomes, particularly with donor-egg sources impacting infant weight. The study underscores the necessity for continuous research and strategies to optimize health outcomes for both surrogate mothers and infants, emphasizing the importance of enhanced prenatal care.

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CONFLICT OF INTEREST

This research paper does not report any conflicts of interest.

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