Volume 3 | Issue 14 |2024

SMART PEDI UPDATE

Pedismart Newsletter
Vol 3 | Issue 14| 2024

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Dear Doctor,
Greetings from Micro Labs Limited. We are happy to bring you **"PEDI SMART"** which contain latest and interesting news in the field of Paediatrics.

This issue contains:

1. **Comparison of the effects of open and minimally invasive surgical methods on wound healing and infection in pediatric otolaryngology surgery**
2. **Identification of factors related to a disturbance in the mother-child bond or attachment**
3. **Identification of risk factors for Pneumocystis jirovecii Pneumonia in children with Systemic Lupus Erythematosus exposed to prolonged high-dose glucocorticoids**
4. **Case report on congenital hepatic fibrosis presenting with fever**

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Limited

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Comparison of the effects of open and minimally invasive surgical methods on wound healing and infection in pediatric otolaryngology surgery

Introduction

Minimally invasive surgery may be a safer and more effective surgical method compared to open surgery that can be promoted and applied in clinical practice.

Pediatric populations are commonly affected by ear, nose, and throat diseases which impacts their health including sinusitis, otitis media, and other diseases. Pediatric otolaryngology surgery is effective in treatment of these conditions. Nowadays, the two main methods of performing pediatric otolaryngology surgery are open surgery and minimally invasive surgery. The selection of surgical method was directly related to the wound healing rate and infection rate after surgery.[1] Pediatric surgery has implemented significant use of minimally invasive surgery (MIS) throughout the past three decades.[2] Hence, this study aims to compare between open and minimally invasive surgical methods on wound healing and infection in pediatric otolaryngology surgery.

Methods

This was a prospective, randomized controlled study which included pediatric patients with ear, nose, and throat diseases requiring surgical treatment, with an age range of 3 to 12 years old. Patients were divided into an open surgery group and a minimally invasive surgery group, with 90 patients in each group. Study evaluated Intraoperative time, anaesthesia time, Bleeding volume, wound healing days, wound-related complications and comparison of pain at 1, 3, and 7 days after surgery between two groups.

Results

The minimally invasive surgical group demonstrated significant advantages in intraoperative blood loss, anesthesia time, and intraoperative time in terms of intraoperative indicators. The group undergoing minimally invasive surgery had an intraoperative time of 32.1 ± 4.2 min, which was significantly shorter than the 45.8 ± 5.6 min in the open surgery group. The group undergoing minimally invasive surgery had anesthesia time of 22.3 ± 3.1 min, while the open surgery group has 30.5 ± 4.7 min. The minimally invasive surgery group noticed an average intraoperative blood loss of 15.2 ± 3.5 mL, much less than the 28.6 ± 4.9 mL lost in the open surgery group. The rate of wound healing days of patients in the minimally invasive surgery was 5.3 ± 1.2 days which was shorter than those in the open surgery group with 8.7 ± 2.4 days. Infection rates were 8%, bleeding rates were 5%, swelling rates were 3%, and other complication rates were 2% in the group undergoing minimally invasive surgery. Among the group undergoing open surgery, the rates of infection were 20%, bleeding was 15%, swelling was 12%, and other complications were 8%. The open surgery group had significantly higher

pain levels on days 1, 3, and 7 following surgery compared to the minimally invasive surgery group.

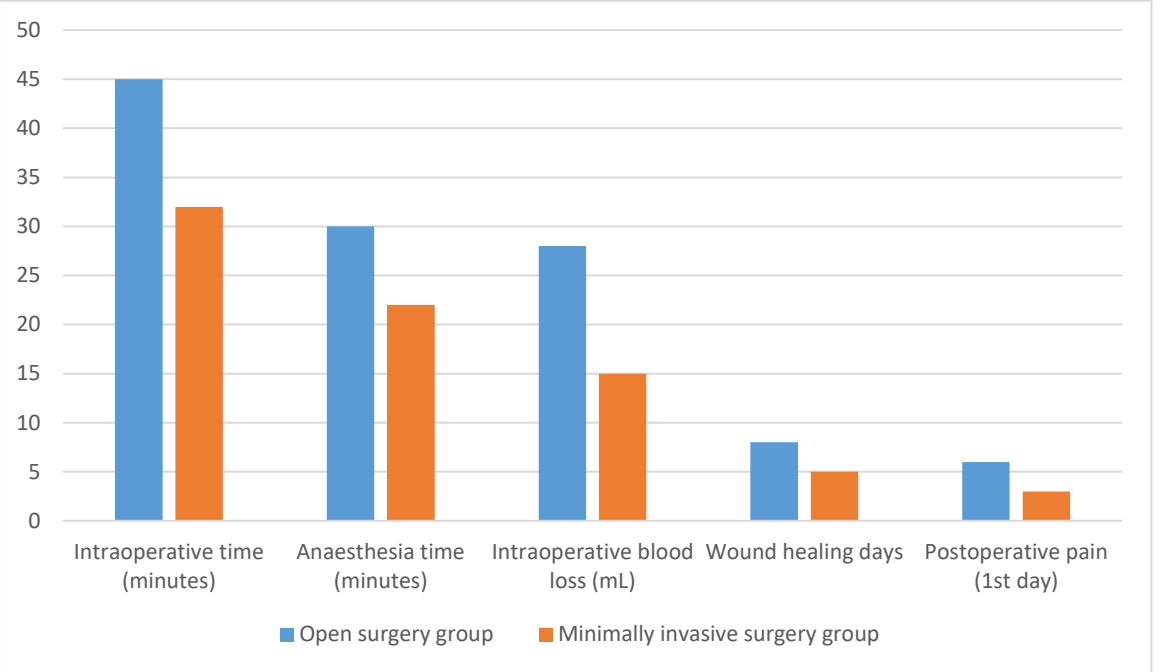

Figure 1. Comparison between open surgery and minimally invasive surgery group

Discussion

In comparison to the open surgery group, the minimally invasive surgery group performed significantly better in terms of intraoperative blood loss, anesthesia time, and intraoperative time. Patients in the minimally invasive surgery group recovered from surgery more quickly and experienced fewer complications after surgery. This demonstrated the clear benefits of minimally invasive surgery in improving patients' postoperative recovery.[1] Several studies have demonstrated that, in certain instances, minimally invasive surgery has significant advantages over traditional open surgery in terms of postoperative recovery, patient quality of life, and complications.[3]

Conclusion

Minimally invasive surgery performs better than open surgery in pediatric otolaryngology surgery in terms of intraoperative operation time, anesthesia time, blood loss, wound healing time, complication rate, and postoperative pain.

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Identification of factors related to a disturbance in the mother-child bond or attachment

Introduction

Skin-to-skin contact and breastfeeding are associated with a lower probability of impaired bonding and attachment

The bond established between a mother and her child is crucial for the woman to adjust to her new role and also has an impact in how the relationship develops between. The emotional connection that forms between a mother and her infant is referred to as a bond. This relationship develops during pregnancy and after delivery. Attachment, which describes the bond that a newborn form with its mother to feel secure and provide a stable foundation from which the infant can explore the environment.[1] A mother's attachment bond with her child plays a crucial role in the cognitive, physical, and emotional development of the child.[2] A disturbance in the relationship has an impact on the mental health of the mother and increases the risk of developing anxiety and depression. In contrast, an attachment disturbance could have an impact on the child's temperament in the future and how he interacts with other children.[1] Hence, this study aimed to identify the risk factors related to mother-child bond and attachment disturbance.

Methods

This was a cross-sectional descriptive study that included women having child between 6 weeks and 18 months of age. Investigators developed a questionnaire, which they then delivered to participants containing sociodemographic, psychosocial, and health variables referring to the mother and the newborn. VAMF questionnaire investigated the mother-child bond and attachment. This questionnaire consists of total of 29 items divided into two subscales, one for bond (VAMF-bond) consisting of 16 items and another for attachment (VAMF-attachment) with 13 items.

Results

A total of 1114 women participated, of which 56.9% (633) of the women were primiparous and 59.1% (658) had a normal birth. 78.5% (875) of the mothers started breastfeeding early, and 83.9% (935) of them experienced skin-to-skin contact. At the time of completion of the survey, 87.9% of respondents did not have any persistent illness or health issues related to pregnancy, childbirth, or the postpartum period, while 42.1% (469) reported having some health issues throughout their pregnancy. 40.5% (451) rated the birth experience as very good and, 59% (657) reported the care received during it was very good. 39% (434) of the women reported receiving extreme support from their partner and 32.1% (358) of the women reported receiving the same level of support from their family. With a mean score of 57.76 on the VAMF bond subscale and a 10th percentile of 53 points, 12.7% (141) of the dyads exhibiting a bond disruption (Figure 1). In the multivariate analysis, skin-to-skin contact and continued exclusive breastfeeding were found to lower the probability of exhibiting a bond disruption. However, experiencing anxiety during pregnancy, childbirth, and the puerperium and postpartum complications increased the probability of having a disturbed bond. The likelihood of exhibiting a disrupted attachment was lower in dyads that had skin-to-skin contact after birth, those who were exclusively breastfed and in which the children were older (months).

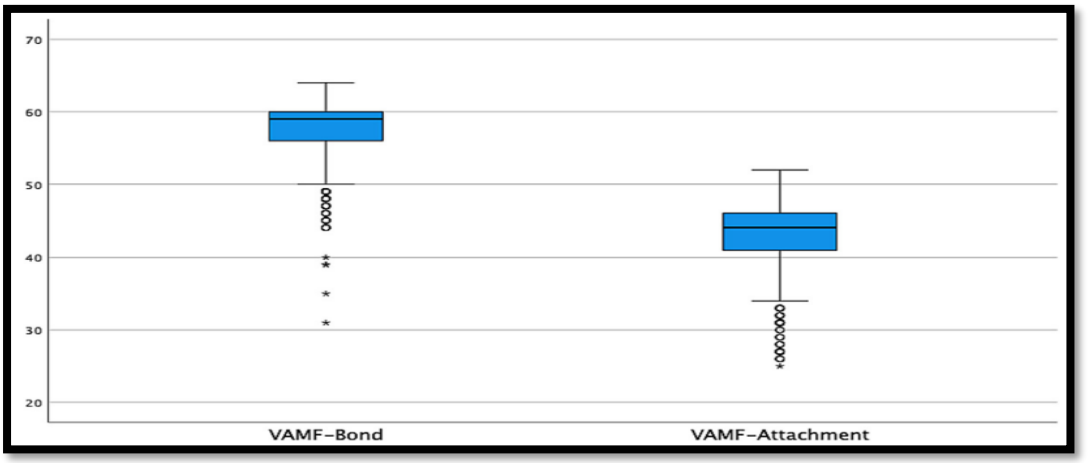

Figure 1. Score distribution on the VAMF subscales for bond and attachment

Discussion

In the current study, the possibility of developing a bond disturbance was found to be lower in dyads who had breastfed their babies and had skin-to-skin contact after childbirth. On the other hand, anxiety during pregnancy, childbirth, puerperium, and postpartum complications, as well as depression before or during pregnancy, increased this probability. Those dyads where the children were older, breastfed, and have skin-to-skin contact right after delivery were less likely to experience impaired attachment. According to this study, there was an increased risk of developing a bond disturbance among women who had anxiety disorders both before and during pregnancy.[1] A similar study by sliwerski et al. found that the presence of depression before and during pregnancy was associated with less bonding and bond impairment.[3]

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Conclusion

Breastfeeding and skin-to-skin contact have been associated to a decreased risk of impaired attachment and bonding. Bond disorder development was more prevalent in patients who experience anxiety during pregnancy, childbirth, and the puerperium, and complications after childbirth. Older the age of the infant, the lower the frequency of having an impaired attachment.

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Identification of risk factors for Pneumocystis jirovecii Pneumonia in children with Systemic Lupus Erythematosus exposed to prolonged high-dose glucocorticoids

Introduction

Elevated levels of creatinine and decreased lymphocyte count are the risk factor to identify pneumocystis jirovecii pneumonia in children with Systemic lupus erythematosus

Systemic lupus erythematosus (SLE) in pediatric population is characterized by a persistent autoimmune disorder with inflammatory manifestations which is treated with glucocorticoids and other immunosuppressive medications. However, long term administration of these immunosuppressive medications was associated with the occurrence of recurrent infections. Among these infections, pulmonary infection was identified as a major cause of mortality for children's with SLE.[1] Pneumocystis jirovecii pneumonia (PJP), is an opportunistic yeast-like fungus that can cause overt pneumonia in immunocompromised hosts and lead to death if left untreated. It usually affects children with primary immunodeficiencies (PID), such as severe combined immunodeficiency (SCID).[2] There were several risk factors associated with PJP, among which important was prolonged use of high-dose immunosuppressive drugs, especially glucocorticoids.[1] Hence, this study aimed to investigate risk factors associated with PJP in pediatric patients diagnosed with SLE.

Methods

This was a retrospective analysis that included a total of 71 treatment episodes involving 64 patients. Of these treatment episodes, 14 were assigned to the PJP group and 57 to the non-PJP

group. Inclusion criteria were individuals who were younger than 18 years with diagnosis of SLE and who had received a minimum daily dosage of 20 mg of prednisone or an equivalent dose of corticosteroid for at least 4 weeks. PJP risk variables were evaluated using Cox regression. PJP incidence was investigated among risk categories using the Kaplan-Meier technique.

Results

In comparison to the non-PJP group, the PJP group experienced a significantly higher frequency of repeated high-dose steroid treatment (50.0% vs. 19.3%). At baseline, the PJP group had a significantly greater creatinine than the non-PJP group, with values of 131.5 (79.6, 197.3) µmol/L and 57.2 (44.0, 91.0) µmol/L, respectively. Compared to the non-PJP group, the PJP group had a significantly lower baseline lymphocyte count (1.0 vs 1.5 10^9/L; p = 0.045). There was a significant difference in the lowest lymphocyte count during the course of the observation period (0.4 vs 0.9 ~ 10^9/L; p < 0.001). The PJP group administered cyclophosphamide (CYC) at a significantly higher frequency (64.3% vs 35.1%; p = 0.046) than the non-PJP group throughout the year that followed the baseline date. In PJP group, 14 children experienced 2 confirmed and 12 had suspected episodes. The median time to PJP occurrence was 4.1 months and 85.7% of cases occurred within the first 6 months. The results showed that creatinine and the lowest lymphocyte count may be independent risk factors for PJP occurrence. According to the receiver operating characteristic curve, creatinine greater than 72.5 µmol/L and the lowest lymphocyte count less than 0.6×10^9/L were the risk factors for PJP obtained an area under the curve value of 0.934. According to Kaplan-Meier survival curves, there was a statistically significant (p < 0.001) increase in the incidence of PJP in the group with two risk factors compared to the group without risk factors (Figure 1). This finding highlighted that the combination of creatinine and the lowest lymphocyte count can better predict the occurrence of PJP.

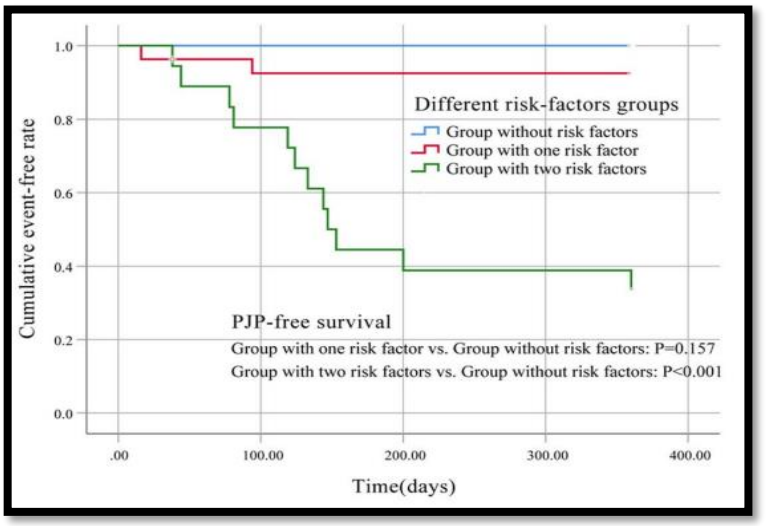

Figure 1. Kaplan-Meier curve displaying PJP-free survival across several risk factor categories.

Discussion

Pneumocystis jirovecii pneumonia is a life-threatening infection that has a high mortality rate, particularly in individuals with impaired immune systems. Elevated creatinine was one of the independent risk factors for PJP in children with SLE diagnosis. An increased creatinine level indicates renal involvement.[1] Wang et al. study stated that individuals with SLE who

experience renal involvement were more susceptible to developing PJP.[3] The findings of this study showed that a decrease in lymphocyte count was identified as an independent risk factor for PJP. In addition, lymphocyte count below 0.6×10^9 /L served as a crucial threshold for deciding whether PJP prophylaxis was required. Considering that low lymphocyte counts and elevated creatinine levels were risk factors for PJP. With a sensitivity of 78.6% and a specificity of 96.5%, these results suggested that the combination of creatinine and the lowest lymphocyte count is a strongly predictive factor of PJP. Wang et al. reported that incidence of SLE was higher in children than adults.[3]

Conclusion

Elevated creatinine levels and reduced lymphocyte count both independently predict PJP and their combination significantly enhances prediction accuracy. Close monitoring was required especially when creatinine exceeds 72.5 μmol/L and lymphocyte count falls below 0.6×10^9 /L.

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Case report on congenital hepatic fibrosis presenting with fever

Introduction

Congenital hepatic fibrosis is a fibro-polycystic disease leads to portal hypertension and varices which can present with life threatening gastrointestinal hemorrhage.

Congenital hepatic fibrosis (CHF) is a rare autosomal recessive condition that results from a malformation of the biliary ductal plate, which causes proliferation and fibrosis of the bile ducts.[1] The prevalence of CHF was 1/10000–20000. CHF rarely exits as a single entity but was often coexists with a broad spectrum of disorders caused by various gene mutations like autosomal recessive polycystic kidney disease (ARPKD) and Caroli syndrome.[2] The primary presentation of CHF includes hematemesis or melena during childhood which was the result of cirrhosis and severe portal hypertension. In present adult hepatology practices, pediatric-onset liver diseases were becoming more prevalent because of latent pathogenesis and increased awareness of congenital disease.[1] Hence, this case reports aimed to describe congenital hepatic fibrosis in a two-year-old girl who presented with fever of unknown origin.

Case presentation

A 2-year-old female presented to hospital with the complaints of intermittent fever since 8 days. On day 3 of fever, patient was treated with Augmentin for a suspected left acute otitis media. On day 6, patient's laboratory investigation revealed mildly elevated levels of transaminases: ALT 37 U/L (0.62 µkat/L) and AST 52 U/L (0.87 µkat/L). CRP and ESR were elevated to 61.4 mg/dL (614 mg/L) and 51 mm/h. On day 8 of fever, patient again presented with complaints of increasing irritability and decreased appetite. Repeat laboratory investigations test of CBC revealed an elevated white blood cell count of 18.2 $\times 10^9$ /L (6.5–13 $\times 10^9$ /L) with neutrophil 60% (22–51%) predominance. IgG was positive and IgM was negative for the cytomegalovirus. Echocardiogram revealed an ejection fraction of 62%, without structural abnormalities or concern for infection. Abdominal X-ray was revealed a non-obstructive bowel gas pattern with inferior displacement of the air-filled stomach, and a soft tissue density in the left upper quadrant of the abdomen. Later abdominal ultrasound revealed hepatosplenomegaly with heterogeneous echogenic liver parenchyma and a recanalized umbilical vein. Subsequently, computed tomography of abdominopelvic with intravenous contrast confirmed hepatosplenomegaly with enlargement of the left hepatic and caudate lobes. Additionally, the scan revealed signs of portal hypertension, with a diminutive right portal vein, enlarged left portal vein with recanalization of the umbilical vein, and upper abdominal varices. Following an MRI with magnetic resonance cholangiopancreatography (MRCP) and MRI elastography scan, several ectatic intrahepatic bile ducts and stage 3–4 hepatic fibrosis were identified. The cumulative imaging results indicated chronic liver disease, particularly hepatic fibrosis. The results of an ultrasound-guided needle biopsy of the liver showed broad bands of fibrosis and bile duct proliferation of congenital hepatic fibrosis. For a total of 14 days, patient received an IV dosage of Zosyn 80 mg/kg every 6 hours. Within 24 hours of starting antibiotics, the patient's fever subsided. Patient had pathogenic variant of one PKHD1 gene which was associated with autosomal recessive polycystic kidney disease (ARPKD). After 15 months of follow-up, the patient has subsequently returned to her baseline state without experiencing a cholangitis recurrence.

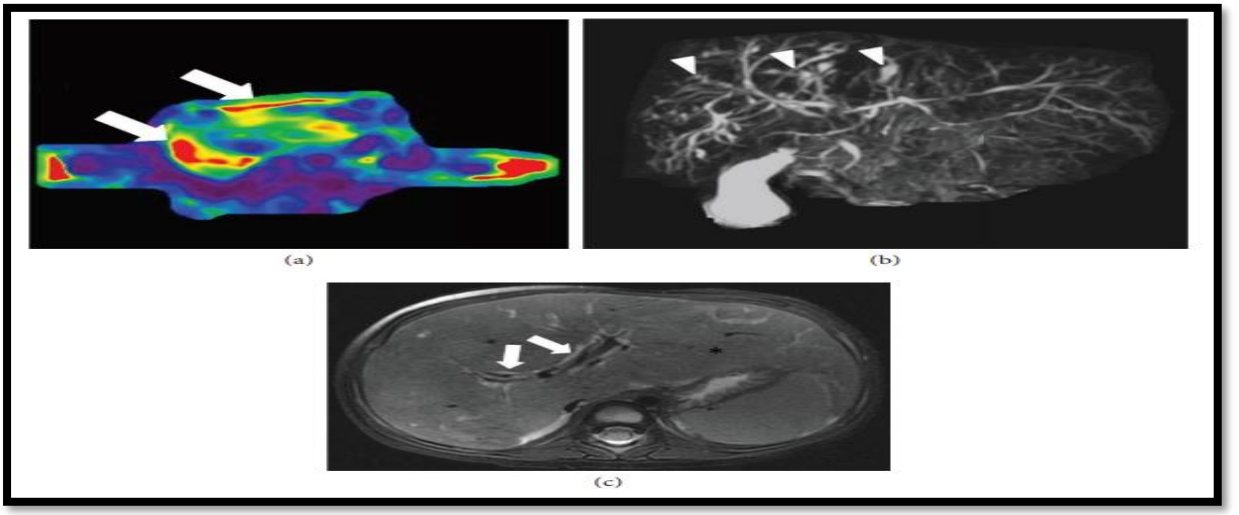

Figure 1. (a) MR elastography showing increased liver stiffness (white arrows) corresponding to fibrosis. (b) Magnetic resonance cholangiopancreatography (MRCP) showing scattered mixed fusiform and saccular dilatations of the intrahepatic bile ducts (arrowheads). (c) MR image showing hepatomegaly with enlarged left hepatic lobe (asterisk) and periportal thickening and T2 hyperintensity (white arrows).

Discussion

Congenital hepatic fibrosis was associated with other extrahepatic and hepatobiliary cystic disease including autosomal dominant polycystic kidney disease (ARPKD) and Caroli's disease. A mutation in the PKHD1 gene may be the cause of ARPKD, which was linked to Caroli's syndrome.[1] A study has stated that wide range of genetic mutations can result in congenital hepatic fibrosis.[3] Laboratory investigation of the present patient showed elevated levels of AST and ALT which was similar with the results of study which showed congenital hepatic fibrosis leads to widespread fibrosis of the liver, in which patients typically exhibit normal to mildly elevated AST and ALT levels with preserved hepatocellular function.[2]

Conclusion

Congenital hepatic fibrosis is a rare, autosomal recessive, fibro-polycystic disease resulting from ductal plate malformation, leading to proliferation and fibrosis of bile ducts. Liver transplantation is curative for these patients but it is reserved for small percentage of patients with chronic or progressive hepatic failure.

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