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Ultrastructural features of enteric ganglia in human foetuses

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Introduction: The Neural Crest derived Enteric Nervous System (ENS) is the intrinsic innervation of gastro intestinal tract (GIT) which consists of neurons and enteric glial cells in the myenteric ganglia. Because of its autonomous control over the GIT, it is also called the "second brain"[1]. The ENS consists mainly of submucosal and myenteric plexuses. Clinical studies revealed that congenital malformations of the ENS seriously affect the gut motility, gastric acid secretion, and water and electrolyte transport[2]. Scarcity of existing literature on the development of myenteric plexus in different segments of the GIT, which are sites of various diseases, motivated this study.

Aim: To determine the ultrastructural features of the myenteric plexus of foregut (oesophagus), midgut (ascending colon) and hindgut (descending colon) with increasing age of gestation (12–30 weeks).

Materials and methods: Tissue samples from Maternal Termination of pregnancy (aborted) foetuses n = 5 aged 12–30 weeks of gestation (WG) were processed and examined under theelectron microscope Tecnai 12 TEM in AIIMS.

Observations: The neuropil appeared lowest in the oesophagus compared to the ascending and descending colon. The size of the neurons and appearance of neuronal processes within the myenteric ganglia increased remarkably with increasing gestational age.

Conclusion: The neuronal cells were more dense in colon compared to oesophagus was independent of gestational age. Neuronal processes were increased with increasing gestation age in both oesophagus and colon.

Significance: The insight about the development of the innervation in different segments of the gut with increasing gestation age may help in understanding the pathophysiology of various congenital disorders affecting ENS.

Conflicts of interest

The authors have none to declare.

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Histogenesis of fetal cerebellar cortex

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Background: Currently, there's minimal research regarding the histogenesis of cerebellum in foetus of various trimesters. In fetus, external granular layer is the precursor of purkinje cell and internal granular cell layer. The genetic conditions ataxia telangiectasia and Niemann Pick disease type C, as well as cerebellar essential tremor; involve the progressive loss of Purkinje cells.

Aims and objectives: The aim is to study the gradual development of various layers of the cerebellar cortex in the aborted fetuses, with emphasis on origin and development of the Purkinje cell layer.

The cerebellar cortex contains three well-defined layers namely,

1. *Thick granular layer*: It is densely packed with granule cells, along with interneurons, mainly Golgi cells.
2. *The Purkinje layer*: A narrow zone that contains the cell bodies of Purkinje cells and Bergmann glial cells.
3. *The molecular layer*: It contains the flattened dendritic trees of Purkinje cells, along with the huge array of parallel fibers penetrating the Purkinje cell dendritic trees at right.

Materials and methods: The study will be carried on 30 fetuses (both males and females) without unknown anomaly.

Gestational age:
Group 1: ≤12weeks
Group 2: 13–24 weeks
Group 3: ≥24 weeks

Dissected fetal cerebellum specimens will be subjected to routine histological processing, and stained with hematoxylin and eosin.

Results: Study is under progress & the results will be presented during the conference.

Conclusion: We get to know the normal development of cerebellum in the fetus & it facilitates in the pathological diagnosis of intrauterine cerebellar changes.

Conflicts of interest

The authors have none to declare.

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X-box binding protein in Ire1 arm of endoplasmic reticulum stress is upregulated by Sflt-1 in trophoblast cells: an in vitro study

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ER is a prime contributor to proteostasis of the cellular environment. To cope with endoplasmic reticulum stress (ER stress), cells activate specific signaling response collectively known as unfolded protein response (UPR). UPR may recover the homeostasis or trigger apoptosis depending on the extent of damage of cell. Oligomerisation of IRE1 and subsequent formation of stable and active transcription factor XBP1 controls genes involved in protein folding and ER associated degradation (ERAD). Placental ER stress is already known in Preeclamptic placentae with imbalance between angiogenic (VEGF) and antiangiogenic factors (sVEGFR1/sFlt-1). However the role of sFlt-1 in regulating ER stress is not known.

Objectives: To study the role of sFlt-1 in the IRE1 arm (activation of x Box binding protein) of the ER stress.

Methods: Blood samples from normotensive (n = 40) and preeclampsia (n = 40) pregnancies were collected at the Department of Obstetrics & Gynaecology, AIIMS (New Delhi, India) with approval from Institute Ethics Committee. The s-Flt-1 level was measured by sandwich ELISA. BeWo cells were incubated with these sera and activation of XBP1 was detected by immunofluorescence, Western blot and RT-PCR.

Results: Maternal levels of sFlt-1 were higher ($p < 0.01$) in serum from preeclampsia compared with normal pregnancies. Protein expression of XBP1 was higher ($p < 0.05$) in BeWo cells exposed to sera from preeclampsia as compared to normal pregnancies.

Similar results were found when the mRNA levels were compared between these two groups ($p < 0.05$).

Conclusion: The increased levels of sFlt-1 detected in preeclampsia had the ability to induce XBP1 in BeWo cells. Thus we contemplate that it is biologically plausible that increased sFlt-1 from preeclamptic mothers may endow for induction of ER stress.

Conflicts of interest

The authors have none to declare.

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Use of monoclonal antibody Ki-67 in assessing the effect of oral Isotretinoin in acne vulgaris patients

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Objectives: To study the effect of oral isotretinoin in the skin of acne vulgaris patients by using Ki-67.

Methods: Skin biopsy was procured from untreated patients of severe cases of acne vulgaris. Out of these, twenty histopathologically confirmed patients were included in the study. They were treated with oral isotretinoin in the dose of 0.5 mg/Kg/day for 12 weeks, following which their skin biopsies were repeated. Immunostaining for Ki-67 was performed using rabbit monoclonal antibodies. Ki-67 index was calculated for the acne patients before and following treatment with oral isotretinoin. Statistical analysis was done using Wilcoxon Signed-Rank Test.

Result: Ki-67 positivity was seen in intrafollicular and interfollicular epidermis in all the 20 patients of acne (12 males and 8 females) before treatment. The Ki-67 index (mean ± SD) in these patients was higher in females (43.85 ± 12.24) as compared to males (39.84 ± 6.98). The Ki-67 index (mean ± SD) in patients of acne after 12 weeks of treatment showed a reduction in both males and females (19.52 ± 5.60 and 21.15 ± 5.2 respectively) as compared to acne patients before treatment. Statistically highly significant post-treatment reduction in Ki-67 index was seen in both male and female patients.

Conclusion: By using Ki-67 immunohistochemically, our study implicates that oral isotretinoin causes a reduction in proliferation of follicular and inter-follicular epidermal keratinocytes thereby, having an effect on acne skin.

Conflicts of interest

The authors have none to declare.

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Fetus-in-fetu: a case report of rare developmental anomaly detected prenatally by color Dopplar ultrasonograpy

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Introduction: Fetus-In-Fetu is a rare birth defect in which a fetus is incorporated within its twin. So, it is essentially an abnormal embryogenesis of monochorionic diamniotic twinning. Reported incidence is 1 in 5,00,000 live births.

Objective: To diagnose developmental anomaly- Fetus-in-Fetu prenatally by using colour dopplar ultrasonography.

Material and method: A routine obstetric sonography examination was done on 20 yrs old primygravida with approximately 18 weeks gestation. The test was performed, on Samsung Medison–Accuvix 30, 4D Doppler machine and was reported by an experienced radiologist.

Result: Approximately 18 weeks fetus revealed a well defined cystic lesion simulating gestational sac in juxta-umbilical region showing collection of heterogeneous tissues suspended in fluid. This mass of tissues was showing vertebral column like structure in the midline with few limb bones around it. Doppler study revealed a pulsatile rudimentary heart in this mass of tissues. This mass was attached to placenta by a cord. These features are characteristic of condition–fetus-in-fetu.

Conclusion: With recent advances in Ultrasonography, the diagnosis of fetus-in-fetu can be made prenatally. In the era of prenatal anomaly scans, such developmental anomalies can be detected in earlier weeks of gestation and will be treated appropriately.

Conflicts of interest

The authors have none to declare.

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Sacralization of fifth lumbar vertebra

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Introduction: Sacralization is a congenital condition where usually the transverse process of L_5 vertebra is either semi or completely fused with the sacrum. The fusion can occur on 1 or both sides of the body. L_5 in this situation appears and works as a sacral component and hence is called sacralized vertebra. An anomaly always poses interesting questions in the mind of the observer and it becomes necessary to study them

Case report: During normal osteology study in the Department of Anatomy in Dr. S.N. Medical College, out of 15 sacrum bones available 1 was found to be partially fused with the L_5 vertebra. It was properly observed and findings were recorded.

Conclusion: Sacralization may present itself as a mild lower backache which can remain undiagnosed if the patient never consults a radiologist. It may be associated with problems of posture control and ways of movement. The fusion of the bones can lead to compression of the associated nerves (L_5 and S_1 spinal nerves) leading to back pain or radicular pain i.e. Bertolotti's syndrome. It has also been suggested that it can lead to difficulty during parturition due to inability of sacrum and coccyx to move back during child birth. The suggested treatment for it remains conservative. Therefore thorough study of this condition is important for radiologists, obstetricians as well as surgeons.

Conflicts of interest

The authors have none to declare.

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