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Review Article

Competency Based Medical Education: Integrating two subjects- Physiology of Infancy

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Abstract

Infancy reflects a multisystem physiological transition from a dependent foetus to a newborn to a one-year-old child. This is a one-of-a-kind review of literature that is helpful for both medical graduates in concordance with the curriculum outlined by the National Medical Commission's Competency Based Medical Education in India and for physicians to keep updated about infantile physiology. An in-depth review of literature shows a gradual transition in the physiology of different organ systems with unidirectional anatomical maturation. The respiratory system is characterised by increasing number of alveoli, diaphragm dominance, compliant chest wall, narrow compressible airway and periodic pattern of breathing. The cardiovascular physiology shifts to a left dominant system upon birth. Fetal hemoglobin gradually diminishes allowing greater unloading of oxygen at tissue level. The glomerular filtration, tubular concentration, gastric and hepatic enzyme secretion improves over the next 12-24 months. Infantile skin performs critical thermoregulation and there is evolution of adaptive immunity. There is substantial growth and acquisition of new developmental milestones with progressive neuronal myelination. The hypothalamic pituitary axis is established in infancy, responsible for the interplay of hormones. The review is a novel attempt to highlight marked functional and anatomical changes seen in all organ systems during first year.

Key words: Adaptation, growth, infancy, maturation, physiology

Introduction

Physiologists have often tried to understand the effect of age on the human body and pediatricians struggle to decipher the abnormal from the normal physiological variations. Much has been taught to undergraduates regarding changes in foetal respiration and circulation at birth, and yet the changes within the first year of life is mentioned in passing in most undergraduate textbooks. This review enables us to understand the transition from a foetus to an infant capable of independent functioning of most parameters.

Infants are not small adults. There are remarkable physiological differences between the two. The first year of life or infancy is the foundation of healthy adult life.

Respiratory changes

Breathing movements begin at a rate of 70/min by 36 weeks of gestation and the frequency reduces to 40-60 breath/minute in a newborn. This increases with hunger, pain, temperature changes and handling of the baby[1]. The newborn is unable to significantly increase the respiratory drive, in response to sustained hypercapnia and hypoxia[2]. Infants have apnoea of infancy and periodical breathing pattern, reflecting immature breathing control and chemoreceptor reactivity to pCO_2 and pO_2, these decrease over the first 12 months of life[3,4].

Young infants are obligate nose breathers and have a large head, a small oral cavity with a big tongue, a long omega-shaped horizontally positioned epiglottis, a narrow cricoid ring and thus a greater tendency for the airway to get obstructed mechanically when the neck is flexed. The pharynx is made from soft tissue, collapsible by pressure on the mandible and hyoid and pressure changes during inspiration. The larynx lies at C2-4 and is funnel shaped. The infant's tracheal length and cross-sectional area is at about 40% and 10-15 % respectively of its adult size[5]. Small peripheral airways contribute to more than 50% of the airway resistance in infants[6].

Young infants have markedly low total lung capacity (TLC) and functional residual capacity (FRC). Newborns prevent atelectasis despite a highly compliant thoracic wall and poorly compliant lung tissue, by generating auto positive end expiratory pressure (PEEP). The diaphragm is major respiratory muscle, intercostal muscles are poorly developed and ribs are horizontally placed, limiting anteroposterior chest expansion with inspiration. Also, the predominant respiratory musculature is the fast twitch type II that progressively matures into fatigue resistant type I by the end of infancy[6].Alveolarisation and surfactant production start in the third trimester and is completed by 2-3 years of age and term gestation respectively, providing greater surface area for gas exchange[4].

Cardiovascular system changes

The cardiovascular anatomy and physiology changes in a newborn; rapidly over a few days. With the first breath and withdrawal of placental circulation, the blood flow in the umbilical vein ceases; there is an expansion of the lung and a fall in pulmonary vascular resistance with an increase in PaO_2, decrease in $PaCO_2$ and pulmonary interstitial pressure. The higher pulmonary blood flow results in the rise in left atrial pressure and subsequent functional closure of the foramen ovale. Ductus arteriosus functionally closes within 24-48 hours and permanently closes by 4-8 weeks[7].

At term, the neonatal cardiac output is approximately 200 ml/kg/minute and reduces to half by 2 years of age[8] though the functional cardiac reserve increases with age[2]. Neonate heart has a higher resting myocardial contractility and is stiff. Therefore, cardiac output can be augmented by an increase in heart rate alone.

The right dominant foetal circulation manifests as right axis deviation and R wave dominance in lead V1 and S wave dominance in lead V6 in neonatal electrocardiography. This transitions to the left ventricular dominance pattern of adulthood by 3-6 months of age[8].

Hematological changes

At term gestation, the newborn blood contains predominantly foetal haemoglobin (HbF) having a higher oxygen affinity, causing tissue hypoxia during stress, manifesting as cyanosis at a lower PO_2. The adult hemoglobin (HbA)attains maximum levels by 6-12 months of age[7]. Infants may have physiological anemia at 8-10 weeks of life, caused by the shorter RBC lifespan, a lower erythropoietin stimulation and relative increase in blood volume[8]. Blood group antigen system may also vary with age. In the Ii system; there is a shift from i to I in the first two years of life[9].

The vitamin K-dependent factors (factors II, VII, IX and X, protein C, S) are at 50% of adult values and contact factors (factor XI, factor XII, prekallikrein and high-molecular-weight kininogen) are 30%-50% of adult values in a term infant[10] and attain adult levels by 6 months of life. Factor I, V, VIII, XIII and von Willebrand factor are at adult levels since birth[11]. Plasma concentrations of alpha2-antiplasmin, antithrombin and plasminogen are at 50%, 60% and 80% of adult range at birth respectively and reach adult level within first week, 3 months and 6 months of life respectively[10-12].

Renal system modifications

The kidneys grow rapidly in the first year of life to final length of 12 cm from 4.5 cm at birth. However; the number of nephrons stays constant.

The glomeruli are smaller and the glomerular filtration rate is 30% of adult value at birth. GFR at birth is about 40 ml/min/ 1.73 m^2, 66 ml/min/ 1.73 m^2 by 2 weeks of age and reaches adult levels of 100–125 ml/min/1.73 m^2 at 2 years. The effective renal plasma flow (ERPF) is 83 ml/min/1.73 m^2 in infants and matures to 650 ml/min/1.73 m^2 by 2 years of age. At birth, 20% of the loop of Henle fails to reach the renal medulla in contrast to 2% in adults[13]. The maximal urine concentration capacity of the term infants (700 mOsm) reaches adult levels (1400 mOsm) by 6–12 months of age, reflecting tubular maturity[14]. Urine output is 15-50 ml at birth and 500ml at 1 year[13].

Water comprises of 75% bodyweight of the term newborn, 40% being in the extracellular compartment. The ECF volume/kg of an infant is twice that of adults[13]. A neonate loses up to 15% of their body weight due to postnatal diuresis in the first week of life, due to a higher value of atrial natriuretic factor. There is a marked decrease in percentage of bodyweight that is comprised of water as the intracellular solid rich component grows more rapidly than the ECF[15]. Serum potassium is higher while bicarbonate is lower in a neonate than in children[16]. Power of hydrogen ion excretion is poor in neonatal kidneys due to less glomerular filtration of phosphate and inadequate synthesis of ammonia by tubular cells. Term infants typically achieve normal serum calcium levels by the second week of life[17]. Fluid requirements are initially 60-80 ml/kg/day, increasing to 150 ml/kg/day over the first week in term infants[8].

The newborn micturates for the first time within 48 hours of life, thereafter passing urine 6-12 times a day. A baby might cry at the initiation of micturition due to discomfort caused by bladder distension. Estimated bladder capacity (ml) in a child less than 2 years is 7 times the weight in kg. The fluid turnover at birth is 7 times greater than an adult[18].

Neurological changes

At birth, only one-fourth of the neuronal cells exist in comparison to adults. Total brain volume is 36% of adult volume at 1 month of age and doubles in the first year. Neonatal cerebral circulation receives one-third of cardiac output to meet the high metabolic need, in comparison to one-sixth in adults. The myelination progresses from the posterior to anterior direction, completed in 2 years, responsible for the positive Babinski's sign seen in infancy[7]. The blood brain barrier is immature in newborns allowing passage of drugs, toxins and plasma proteins to the brain. The anterior and posterior fontanelle are open at birth, fusing at 12-18 months and 6-8 weeks of life respectively, permitting brain growth. The spinal cord ends at the level of L3 in neonates and reaches L2/3 by 12 months. The dural sac shortens from S3 to S1 by one year of age.

The total duration of sleep is highly variable in the newborn baby. It can range from 16-22 hours, usually decreasing with age to15 hours/day in a 12-month-old, only interrupted for feeding. There is an equivalent distribution of the immature rapid eye movement (REM)/active and slow wave / immature (NREM) sleep at birth. As the circadian rhythm develops, a 4-month-old infant is able to sleep for a longer duration at a stretch during night. By 6 months a mature sleep electroencephalogram (EEG) develops with demarcation of an initial NREM followed by REM sleep[19].

The EEG is characterised by a 3-4 Hz posterior dominant rhythm, asynchronous sleep spindles of 10-15 seconds duration, sharp V waves and K complexes at 2 months of age, 5-7 Hz discharges at 12 months and maturing into the adult alpha pattern of 8 Hz frequency by 3 years. REM sleep diminishes from 50% in neonates, to 30% in 1-2 years of life[20].

Musculoskeletal system changes

The rate of increase in head circumference is 3.5cm/month at birth and reduces to 1.2 cm/month at 1 year. At birth, the head is large and the head circumference exceeds the chest circumference by 3 cm. These two equate by 1 year of age and thereafter the chest circumference exceeds. The arms and legs are short and the umbilicus is the midpoint in a newborn when assessing the length. The spinal column has anterior curvature. The cervical and the lumber curvature begin when head holding and walking are initiated[1].

Growth and Development

The initial neonatal weight loss is regained at approximately 30 grams per day for the first two months and 20 grams per day in next two months. The birthweight is doubled by 4 months, triples by 1 year of age. Growth velocity declines from 20 cm/year in the first few months to 10–12 cm/ year by 1 year of age. The birth length doubles by 1 year of age. Tooth eruption starts in the central mandible at 6-12 months of life[21].

In the first 3 months of life, the neonatal grasp reflex begins to disappear and milestones like smiling, maternal recognition and efficient sucking develop. The 2-month-old baby can recognize facial expressions. The early infant cries to express displeasure, peaking at 6 weeks of life. The recognition and working memory improve with maturation of the hippocampus at 6 months. Simultaneously the asymmetric tonic neck reflex disappears allowing the infant to examine objects in the midline and reach out for objects. They become interested in their own body parts, vocalise and begin to interact with others. A characteristic feature at this age is the tendency of mouthing objects. At the age of 7-10 months; infants can sit unsupported, pivot and tend to explore their surroundings. An infant becomes mobile during this period through the ability to creep and crawl independently. By 9 months, the infant can understand that the object continues to exist even after it is removed from the field of vision. They show signs of anxiety when they are separated from their caretakers or approached by strangers. A critical development at this age is the integration of the limbic and endocrine systems into the memory network[22]. Communication improves by 8-10 months of life as the baby starts babbling, points to objects and shares toys. By 12 months, the baby can stand independently and has a mature pincer grasp.

Gastrointestinal tract modifications

The taste sensation becomes distinct by 2-3 months. Salivary secretion increases over the first 6 months[13]. Efficient, coordinated oral and pharyngeal movements for swallowing gradually develop. Infants tend to regurgitate milk, but that tendency resolves in 80% by 6 months of life.

The high gastric acid production temporarily ceases after 2 weeks of life and then resumes secretion after 4 months. Gastric lipase activity in infants is comparable to that of adults having a fat rich diet. It carries out 60 % of dietary triacylglycerol (TAG) hydrolysis in infants in comparison to 10–30 % in adults[23]. Pancreatic lipase-related protein 2, bile salt stimulated lipase and proteolytic enzymes are adequate at birth, but amylase, pancreatic triglyceride lipase, phospholipase A2 and bile acids are low[24]. Intestinal absorption of fats, mono and disaccharides is less[13]. The newborn passes meconium which is dark and viscous, usually in 24 hours of life. It changes to yellow-brown transition stools in 4-5 days. The stool frequency is highly variable in infants, it can be as high as 6-8 times a day; precipitated by bowel emptying after each feed, namely the gastrocolic reflex or as less as once in 3-4 days[18].

Hepatological changes

The newborn's first feed accentuates portal blood flow and provides an opportunity for the microbial colonisation of the large gut that produces vitamin K for the newborn.

The hepatic microsomal enzymes like CYP 450, sulfotransferases, uridine diphosphoglucuronyl transferase (UDPGT) increase over 12 months of life.Gamma glutamyl transferase (GGT) also rises from 30 IU/l to 120–150 IU/l in first few months. Conjugation by UDPGT improves water solubility of bilirubin, allowing excretion of bilirubin across the bile canaliculi into the gastrointestinal tract. Here the bilirubin is deconjugated by the intestinal enzyme glucuronidase in a newborn, where it is again transported to the liver for conjugation and this is termed as enterohepatic circulation. Erythrocyte hemolysis and immature liver function is responsible for physiological jaundice which occurs after 48 hours of birth[25]. While serum albumin in newborns is at the adult range, it takes a few days for normalisation of plasma coagulation proteins and ceruloplasmin.

Hepatic glucose 6 phosphatase breaks down glycogen to prevent neonatal hypoglycaemia[13]. Gluconeogenesis is enhanced as hepatic enzyme secretion improves. Liver is the main site of conversion of fatty acids into ketone bodies during a fast period and storage as triglyceride during a period of abundance.

Skin and mucosa alterations

Full-term newborn skin is well-developed and functional at birth. The vernix coating over a newly delivered baby is a complex mixture of 80% water, 10% protein and 10% lipids, protects the epidermis from water exposure, allowing the subcutaneous protective barrier to form. Infants between 3-9 months have higher dermal hydration and lower total sebum concentration than adults. Skin dryness, peeling and lesser vernix are commonly observed in post-term infants[26]. Premature babies have fewer cornified epidermal layers and fewer sweat glands posing a risk of electrolyte imbalance, thermal instability and infection. The thermoneutral zone is 30-32ºC in term and 35ºC in preterm newborns[13]. As the surface area to mass ratio is higher in infants, chances of heat loss are greater. Non shivering thermogenesis is carried out by brown fat[13,27].

Infants have lower concentration of melanin in sun-exposed regions in contrast to adults. The staphylococci are predominant microflora on newborn skin[28]. At birth, all human hair is in the anagen phase; this transitions in an asynchronous manner to catagen and telogen phases [7].

The newborn genitals exhibit maternal effects of oestrogen up to 4 weeks following birth.[29] Thereafter, the vulvar skin thickness decreases and mons pubis and labia majora lose subcutaneous fat. Labial adhesions may be a benign finding between ages 2 months to 2 years due to oestrogen deficiency.

Eye development

The newborn eye is 65% of adult size. Maximal postnatal growth occurs in the first year of life and continues till puberty. The cornea is clear, measures 10 mm in size and grows by 2 mm to reach adult diameter by 2 years. The iris gets progressively pigmented till 6 months of life. The lens continues to grow throughout life. The newborn's fundus is less pigmented and retinal vasculature, macula and fovea are less well defined. Within 4-6 months of age, the fundus approximates the adult eye. Colour vision is also developed by this age. The newborn eye is hyperopic at birth. Power in the range of between $+0.50 \leq D \leq +4.00$ is defined as physiological refraction at birth, up to +3.50 D at 8 months and + 2.00 D at 1 year. A coordinated development in both corneal power and axial length modifies refraction. Recent studies show that gestational age at birth affects the incidence of refractive errors[30]. Visual acuity in newborns is 20/400, improving rapidly to 20/30 – 20/20 by 2 years of age. A 6 weeks old infant can fixate and follow. Tear production occurs after 1-3 months of age[7].

Hearing modifications

A normal newborn baby startles to sound and quietens on hearing mother's voice by 3 months. They can localise sound in a horizontal plane and begin to vocalise by 6 months of life. At 7-12 months of age, an infant correctly localises sound in any plane. Failure to attain these milestones should prompt referral for oto-acoutic emission (OAE) or auditory brainstem response (ABR). Delay in diagnosis results in impaired language acquisition, communication and poor school performance[31].

Immunity evolution

Immunity is underdeveloped in the neonatal period. Total neutrophil count is high at birth, but the bactericidal function is immature. The monocytes and dendritic cells have poor toll-like receptor function, signalling pathways and cytokine response; responsible for a greater risk of mycobacterial and viral diseases. CXCL8-producing T cells in newborns are higher than in adults, performing an innate effector function. Over the first quarter of infancy, CXCL-8 plasma concentrations decrease whereas IL-17A rises. Innate lymphoid cells (ILC) are the sentinel cells in infants present in all body tissues[32,33]. Newborn complement proteins are lower than in adults, acting through lectin or alternative pathways predominantly.

Thymus is large at birth and infancy. Naïve foetal CD4+ cells promote self-tolerance. Peripheral T regulatory cells represent 3% of the total CD4+ T cell population at birth and 10-20% in a 2-year-old. Neonates tend to mount greater Th2 production than Th1. The infantile bone marrow is unable to differentiate stromal cells into plasma cells. Over time, immunological memory improves with exposure to infections and vaccinations[34].

The newborn humoral immune response is also blunted with incomplete immunoglobulin class switching. IgM and IgA levels rises rapidly after birth and IgG synthesis commences at 4 months of age[13]. Passive maternal IgG transfer protects against many infectious diseases. B cell somatic hypermutation of antigen site reaches adult levels of different antibodies by 6 years of age. Hence neonatal immunizations often result in low-titre responses and poor seroconversion rates.

Endocrinological changes

The hypothalamic-pituitary axis develops during foetal life but is fully mature by 9 months of age. Breast engorgement and nipple milk discharge may be noted till 2 weeks in newborn girls and boys due to the persistence of maternal hormones. In the first week of life, after withdrawal of oestrogen, there is rise in LH and FSH.This is known as mini-puberty and may manifest as mucoid white vaginal discharge or bleeding. By 4 months of age, the LH and FSH level return to prepubertal level and stays quiescent until late childhood[35].

At birth, there is a surge of stress hormones, namely cortisol, glucagon and catecholamines and fall in insulin. This predisposes to neonatal hypoglycaemia[36]. Thereafter a tight control is maintained by the interplay of pancreatic hormones. Adrenal production of cortisol follows a circadian rhythm, having peak secretion at 8-9 am and a nadir is observed at 11 pm[37].

The concentration of thyroid hormones is 3 times higher in the neonatal period and the values decrease by 1 year of age, remaining constant thereafter till puberty. Thyroid binding globulin (TBG) increases by 60% in post-neonatal period and starts to decline by puberty[38].

Growth hormone (GH) is secreted in a pulsatile manner in response to sleep and feeds. There is a decrease in pulse amplitude, frequency and baseline level after 2 days of life, remaining low till 2 years. GH receptor levels are upregulated by 6 months in different tissues. Insulin like growth factor (IGF1)doubles to adult value at 15-18 months. Insulin-like growth factor binding protein (IGFBP) 1 level falls after the neonatal period and IGFBP3 level gradually rises over 2 years of life[39].

Factors affecting physiological changes in infancy

1. Genetic factors
The genetic makeup of the child decides the physical characteristics, modulates hormonal influences, and is also responsible for pathological basis of several diseases.

2. Nutrition
Colostrum is crucial for growth, maternal bonding and is an immunological boost. Exclusive breastfeeding for 6 months prevents respiratory tract infection, diarrhoea, eye infections and vitamin A deficiency[40]. It should be followed by the start of semi-solid complementary feeding, allowing expansion of the infant's palate and to meet nutrient needs.

Overnutrition accelerates skeletal maturation whereas undernutrition causes short stature. Indian children have been characterised to have a 'thin-fat phenotype', described as a 'muscle-thin but adipose' body composition. Indian babies are smaller in all anthropometric measurements, with relative preservation of body fat; a manifestation of a 'thrifty metabolism'as assessed by subscapular and triceps skinfold thickness. This feature has been observed from birth till 6 years of age[41].

3. Family structure
Elders provide emotional security to the infant. The education qualifications, employment status and availability of the parents and older siblings are responsible for the language development, intellectual stimulation of the growing infant.

4. Cultural practices
Culture influences practices like bathing, 'Kajal' application, oiling, diverse food fads and acceptability of vaccination. It also decides the family structure and acceptability of healthcare services.

5. Immunisation status
Vaccination is a cost-effective strategy to protect children against communicable diseases. The high prevalence of infections in the community, multiple vaccines at once and use of adjuvants are responsible for altered vaccine efficacy in a region.

6. Parental education status
Educated mothers are aware of infant feeding and rearing practices.

7. Socio economic status
The income decides the purchasing power of the family. It is a determinant of housing conditions, environmental sanitation, and health-seeking behaviour of the family[40].

8. Birth order
A J-shaped relationship is noted between the birth order of children and neonatal mortality. It suggests that although both first and last-born children are at a higher risk of dying, the latter are at the worst risk. However,first-borns are least vulnerable during infancy, and the risk increases with successive births. These findings are highly consistent with the 'Resource Depletion Hypothesis' according to which, with the

addition of successive children in the family, parental resources, both material and emotional, become diminished[42].

9. Race

Studies in United Kingdom show that Indian infants are twice less likely than white infants to have a gross motor delay when factors like household income, maternal education, cultural tradition and family composition were taken into account[43].

Infancy is characterised by a remarkable changes in different organ systems, that forms the foundation of a healthy adult, as depicted in **Figure 1**. The changes at birth and one year of age are tabulated in **Table 1**[44-47].

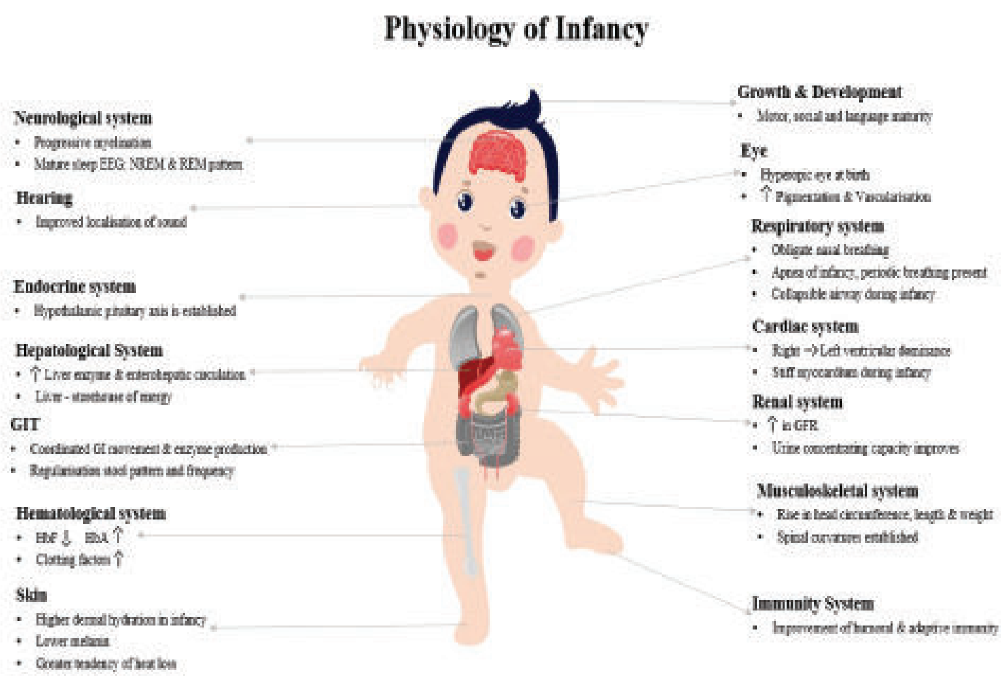

Figure1: Physiological changes in different organ systems in Infancy

Table I. Changes of Physiological parameters from birth to one year of age. [44-47]

Parameter	Birth	1 year
Length(cm)	50-52	75
Head circumference (cm)	34-36	46-47
Chest circumference (cm)	31-33	46-47
Hematocrit (%)	55(45-65)	38(33-44)
Hemoglobin (g/dl)	17(14-20)	12(10.5-14)
Mean corpuscular hemoglobin (MCH) (pg)	32-40	24-30
Mean corpuscular hemoglobin concentration (MCHC) (g/dl)	34-36	30-36
Mean corpuscular volume (MCV) (fL)	94-118	76-88
Red blood cell count $X10^6$ (cells/mm^3)	3.5-6.5	3.9-5.1
Reticulocyte count (%)	0.4-6	2
White blood cell count (cell/mm^3)	$18x10^3(9-30x10^3)$	$10x10^3(6-15x10^3)$

Table I. Changes of Physiological parameters from birth to one year of age. [44-47] *(Cont.d)*

Parameter	Birth	1 year
Differential leucocyte count (Neutrophil, Lymphocyte)	$N_{70}L_{20}$	$N_{45}L_{50}$
Blood volume (ml/Kg)	61-100	73-78
Serum iron (µg/dl)	neonate: 100-250	40-100
Total iron binding capacity (TIBC) (µg/dl)	neonate:150-200	200-400
Serum transferrin (mg/dl)	neonate: 130-275	200-360
Serum ferritin (ng/ml)	neonate: 25-200	50-600
C3 (mg/dl)	1month:53-124	84-174
C4 (mg/dl)	1month:6.6-23	12-40
IgG (mg/dl)	503(251-906)	679(345-1213)
IgM (mg/dl)	45(20-87)	93(43-173)
IgA (mg/dl)	13(1.3-53)	44(14-123)
Sodium (mmol/L)	133-146	134-144
Potassium (mmol/L)	3.2-6.0	3.5-6.1
Alanine aminotransferase ALT (U/L)	6-40	12-45
Aspartate aminotransferase AST (U/L)	24-100	22-63
Albumin (g/dl)	1week:2.5-3.4	1.9-4.9
Glutamyl transpeptidase GGT (U/L)	13-147	5-32
Thyroxine T_4 (ng/dl)	11.0-21.5	7.2-15.6
Triiodothyronine T_3 (ng/dl)	100-380	102-264
Thyroid stimulating hormone TSH (µIU/ml)	$<$2.5-13.3	0.5-4.5
Thyrotoxin binding globulin TBG (mg/dl)	1.0-9.0	2.0-7.6
Growth Hormone (ng/ml)	5-53	2-10
Glomerular filtration rate (ml/min/1.73m^2)	39(17-60)	103(49-157)
Bipolar renal length Mean ±SD (cm)	1month:4.3±0.6	5.7±0.4
Bipolar renal volume Mean ±SD (ml)	1month: 9.7±4.7	21.3±5.5
Heart rate(bpm)	95-160	110-170
SBP(mmHg)	73±8	96±30
DBP(mmHg)	50±8	66±25
QRS Axis range (mean)	+30 to 180(110)	+10 to +125(+60)
PR Interval (sec)	0.08-0.12	0.10-0.14
QRS duration (sec)	0.05	0.05

Conclusion

The period of infancy is characterised by changes in all organ size and functional capacity. This review showcases changes taking place in first 12 months of life at a glance. In the new competency based curriculum, the first year MBBS student is taught this as a competency to enable them to differentiate the pathological findings from the normal physiology.

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