

## Primary Division Ratio of Umbilical Arteries and Vein of the Human Placenta in Abnormal States of Pregnancy and Development

Umbilical vessels on the chorial surface of the human placenta divide into primary divisions, the number of which ranges from 2–5<sup>1</sup>. It has been shown that in placentae from cases with normal pregnancy and development, the umbilical vein has one division more than those of the arteries<sup>2</sup>. In certain abnormal states, e.g. multiple pregnancy and abnormalities of development, this ratio is reversed, i.e. arteries have one division more than that of the vein<sup>3</sup>. This reversal of primary division ratio has been regarded as a 'Parameter of stress' of the anatomy of foetal blood vessels of the placenta, which slows down the circulation for facilitating exchanges

a significant association with incidence of multiple pregnancy and developmental defects, while the ratio is not altered significantly in prematurity, placenta previa and hydramnios.

The above findings suggest that reversal of primary division ratio represents a selective elongation of the arterial bed, representing an increased branching at the highest levels, without a concomitant elongation of the venous bed. Its association with increased tortuosities of arteries and an apparent widening of calibre support the above surmise. Consequently, it contributes towards a slowing of the blood stream in such conditions<sup>4</sup>.

Primary division ratio of arteries and veins

Entity	V > A vein more	V = A vein and artery equal	V < A vein less	Total	Individual X <sup>2</sup> value	Signifi- cance
Normal	79 (47.30)	71 (42.52)	17 (10.18)	167 (100.00)	—	—
Prematurity	27 (50.94)	23 (43.40)	3 (5.66)	53 (100.00)	1.17 d.f.l.	—
Placenta previa	15 (55.56)	8 (29.62)	4 (14.82)	27 (100.00)	0.44 d.f.l.	—
Twins	59 (39.60)	57 (38.25)	33 (22.15)	149 (100.00)	7.70 d.f.l.	P < 0.01
Hydramnios	60 (51.72)	39 (33.62)	17 (14.66)	116 (100.00)	1.24 d.f.l.	—
Abnormal development	46 (38.98)	44 (37.29)	28 (23.73)	118 (100.00)	7.39 d.f.l.	P < 0.01
Hydramnios and abnormal development	18 (39.13)	16 (34.79)	12 (28.08)	46 (100.00)	8.71 d.f.l.	P < 0.01
Total	304	258	114	676		

across the placental barrier. The present communication is directed towards elaborating the manifestation of this parameter in various abnormal states of pregnancy and development.

509 placentae of cases with abnormal pregnancy or development (prematurity 53, placenta previa 27, multiple pregnancy 149, hydramnios 116, developmental defects 118 and coexisting hydramnios and developmental defects 46) have been subjected to injection corrosion preparations, using a continuous injection of 10–15% solution of cellulose acetate buterite in acetone, with pressures within physiological limits. The umbilical vein may have more, equal or lesser divisions than the umbilical artery. Cases, where vein has fewer primary divisions than the artery, have been regarded as abnormal. This abnormal manifestation in different clinical entities has been analyzed in comparison with similar observations on 167 normal placentae by means of Chi square test.

The relative incidence of the different primary division ratios in various clinical states is presented in the Table. It shows that the reversal of primary division ratio bears

*Zusammenfassung.* Es wird gezeigt, dass die Verzweigungen der Nabelschnurgefäße am Übergang auf die Membrana chorii bei Zwillingschwangerschaften, Fehlbildungen des Fetus sowie beim Hydramnion signifikante Abweichungen von der Norm zeigen.

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<sup>3</sup> I. BHARGAVA and P. T. K. RAJA, in press (1969b).

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## Cycloheximide-Induced Ultrastructural Changes in the Adrenal Cortex of the Rat

It is known that cycloheximide has a generally inhibitory effect on protein synthesis<sup>1,2</sup>. Studying corticosteroid synthesis in rats treated with cycloheximide, a compound known to inhibit protein synthesis, a rapid decrease in the rate of steroid production has been observed with an increase in the free cholesterol content of the adrenal cortex<sup>3,4</sup>. Adrenocorticotrophic hormone (ACTH), administered after cycloheximide, was found further to increase the free cholesterol. Having found that  $\Delta^5$ -pregnenolone intensified steroid synthesis, the authors concluded that the free cholesterol  $\rightarrow$  pregnenolone process was inhibited. A study of the cycloheximide

effect on pancreatic and hepatic ultrastructure has recently appeared<sup>5</sup>. The principal changes were the pre-

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