

RARE VARIANTS OF SOME PLACENTAL ENZYMES IN DIFFERENT CASTE GROUPS OF ANDHRA PRADESH

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A total of 1622 placental samples belonging to Brahmins (280), Vysyas (196), Muslims (294) and Scheduled Caste (852) groups living in Andhra Pradesh were studied electrophoretically with respect to different enzyme markers, LDH, MDH and GDH. No LDH variant reported to date was observed in the present study. However, one sample from Brahmins, two samples from Vysya, five samples from Muslims (2 from Shia and 3 from Khoja) and seven samples from among the Scheduled Castes (1 from Madiga, 2 from Paky and 4 from Mochi) displayed the variant types of M-MDH. No variant type of the soluble MDH was observed in the study. Further, no placental sample showed any genetic variant of glutamate dehydrogenase enzyme system.

Key words : Placenta, Electrophoresis, LDH, MDH, GDH.

INTRODUCTION

LDH is a tetrameric enzyme consisting of 2 kinds of polypeptides, A and B controlled by two separate gene loci, LDH_A and LDH_B on chromosomes 11 and 12, respectively. (Boon *et al.*, 1972; Chen *et al.*, 1973). The electrophoretic pattern of LDH from Human placenta shows five isozyme bands designated from the anodal end as LDH-1, LDH-2, LDH-3, LDH-4 and LDH-5.

MDH occurs in all the tissues and it also plays a key role in carbohydrate metabolism. On electrophoresis, the MDH enzyme from human placenta displays an anodally migrating component representing the cytoplasmic or soluble form (S-MDH) and a cathodally migrating component representing the MDH isozyme of mitochondrial origin (M-MDH). (Shargo, 1965). The gene locus of the mitochondrial form (M-MDH) is present on chromosome 7 while the gene locus of cytoplasmic form (S-MDH) is present on chromosome 2 (Gee *et al.*, 1974).

GDH is a homogeneous protein that converts glutamate to α -Ketoglutarate and *vice versa*. It represents a key link between catabolic and metabolic pathway. The literature on electrophoretic studies of glutamate dehydrogenase is very scanty. Very little work has been done in relation with this enzyme variation. (Nelson *et al.*, 1977; Sree Ram Kumar, 1980).

The present study was aimed at determining the distribution of LDH, MDH and GDH isozymes among a few caste populations of Andhra Pradesh.

MATERIALS AND METHODS

1622 human placentae from individuals belonging to Brahmins (280), Vysya (196), Muslims (294) and scheduled castes (852) groups were screened electrophoretically for the three enzyme systems following essentially the method as described by Sree Ram

Kumar & Rao (1982). For the electrophoretic study, the homogenates were prepared by grinding 1 to 2 gms of placental tissue with an equal volume of distilled water in a teflon homogenizer held in ice. Later the homogenates were centrifuged at 3000 rpm for 20 minutes. The clear supernatants were separated and used for electrophoresis.

RESULTS AND DISCUSSION

The distribution of placental enzyme variants of LDH, MDH and GDH as found in the present investigation among the different caste groups of Andhra Pradesh are shown in Table I.

Table I : Distribution of some rare placental Enzyme variants among different caste groups of Andhra Pradesh.

Population	Number tested	LDH	S- MDH types		M – MDH types		GDH
			1 – 1	2 – 1	1 – 1	2 – 1	
Brahmins	280	-	280	0	279	1	-
Vysya	196	-	196	0	194	2	-
Shia	101	-	101	0	99	2	-
Khoja	193	-	193	0	190	3	-
Madiga	283	-	283	0	282	1	-
Mala	192	-	192	0	192	0	-
Paky	162	-	162	0	160	2	-
Mochi	215	-	215	0	211	4	-

Four different genetic variants of LDH were reported from India. (Das *et al.*, 1972a). These were Calcutta-1, Madras-1 (Das *et al.*, 1970); Calcutta-2 and Delhi-1 (Das *et al.*, 1972a & b). The LDH variants on the whole are all of a very rare occurrence. No variant reported to date was observed in the present study. However, in the present investigation, one sample from Brahmins, two samples from Vysya, five samples from Muslims (2 from Shia and 3 from Khoja) and seven samples from among the scheduled castes (1 from Madiga, 2 from Paky and 4 from Mochi) displayed the variant type of M-MDH as shown in Table I.

The electrophoretic pattern of the variant type of M-MDH resembled that of the M-MDH₂₋₁ variant pattern described by Davidson & Cortner (1976) and Sree Ram Kumar (1980). No variant type of the soluble MDH was observed in this study. However, 6 different variants of S-MDH were reported in the different populations of the world by several authors earlier. From India, only one case of S-MDH₅₋₁ was reported by Papiha *et al* (1977) and one case of S-MDH₂₋₁ by Das *et al.* (1973).

All the samples screened for glutamate dehydrogenase moved anodally as single band. No variation could be detected. The enzyme seems to be highly monomorphic in all the populations studied.

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