

CASE I: B. H. # 262 436

Parkland Memorial Hospital

November 21, 1963

MEDICAL GRAND ROUNDS

This 36 year old colored male was brought to the EOR in a stuporous state because they were unable to arouse him. Although he had been drinking for many years, he apparently was well the evening before. He was found by his wife who had administered large amounts of glucose. He was brought to the EOR in a stuporous state. Physical examination revealed increased physical activity, hyperreflexia, tachycardia and at times hostile behavior. He "fought a fight". However, it was not possible to arouse him. He was brought to the EOR where blood tests were done. He was given 50 per cent glucose intravenously which promptly restored him to consciousness. He was given his regular and combative behavior. FBS 140 mg per cent. Physical examination was not remarkable except for 35 hepatomegaly. Intravenous glucose and vitamins within 24 hours produced typical diabetic response. BSP on the second hospital day showed 20 per cent retention. This fell to 10 per cent within a few days. BUN on admission was 8 mg per cent and rose to 14 mg per cent. Workup failed to reveal any of the usual causes of diabetic hypoglycemia.

CASE II: # 162 233

This 40 year old colored female known chronic alcoholic and heavy drinker, was brought to PMH in a comatose condition. Initially she was unresponsive but had a stroke but after the intravenous administration of 50 cc of 50 per cent glucose she became alert and all neurological signs of cerebrovascular accident disappeared. Her blood glucose prior to administration was 10 mg per cent. The physical examination was that of a recent alcoholic binge during which she did not eat for several days. She drank a fifth of whiskey per day. Physical examination was not remarkable insofar as liver disease was concerned. Serum bilirubin on admission was 1.9 mg per cent and fell to normal in 2 days. BSP on the fourth hospital day showed 19 per cent retention and fell to 10 per cent by the 6th hospital day. Liver biopsy was normal. Fasting blood glucose was normal.

"ALCOHOL-INDUCED HYPOGLYCEMIA"

One year later after drinking only a small amount of whiskey and not eating during the same period of time she was again brought to PMH in a comatose state. Her blood glucose was 35 mg per cent and she again responded promptly to intravenous glucose administration. Three days of a 1200 calorie diet containing only 50 grams of protein and 50 grams of carbohydrate followed by one day of complete fasting and exercise resulted in fasting blood glucose concentrations of 72 and 70 mg per cent. BSP test showed only 4% retention. Serum bilirubin was 1.1 mg%. Workup for panhypopituitary or adrenal disease was negative.

CASE III: B. H. # 262 460

This 51 year old cm was brought to the EOR in a stuporous state. Prior to becoming stuporous, he noted an episode of weakness, nervousness, and shakiness. He lost consciousness, fell to the floor hitting his head and nose. On the floor he was found to have a blood glucose of 18 mg per cent and responded immediately to intravenous glucose. He gave a long history of alcoholism and noted in the past two years many attacks of weakness and nervousness at times progressing to unconsciousness. These occurred during heavy drinking sprees when he had not eaten for several days. Physical examination revealed no evidence of pituitary or adrenal disease. Only an enlarged 12 x 10 cm non-tender liver was found. His BUN was 7 mg per cent and numerous fasting blood sugars ranged from 198 to 189 mg per cent, most values being over 180 mg%. His glucose tolerance tests were diabetic, the blood sugar at 3 hours being 400 mg per cent and at 6 hours 262 mg per cent. One brother had diabetes. After 36 hours of a 1200 calorie diet followed by 36 hours of fasting, his blood glucose was 102 mg%. Twenty-four hour 17 ketosteroid excretion was 7.4 and 7.7 mg. Liver function studies were as follows:

T. P. with A/G = 8.7 with 5/3.7; Bilirubin 0.5 mg%; BSP 15% retention; Prothrombin 11.5 sec.

He remained asymptomatic throughout his hospital stay and was discharged with the diagnosis of diabetes mellitus and alcohol-induced hypoglycemia.

CASE I: [REDACTED]

This 36 year old [REDACTED] man was brought to [REDACTED] in [REDACTED] 1960 by his family because they were unable to arouse him. Although a heavy drinker for many years, he apparently was well the evening before admission despite the fact that he had consumed large amounts of alcohol, including bootleg whiskey, ate poorly and became drunk. The day of admission the patient developed a peculiar behavior characterized by loud irrational talking and increased physical activity. After about 3 hours of this unmanageable and at times hostile behavior he "fell asleep". However, later when it was not possible to arouse him he was brought to the EOR. After blood tests were drawn he was given 50 per cent glucose intravenously whereupon he responded by awakening and resuming his maniacal and combative behavior. FBS prior to glucose administration was 28 mg per cent. Physical examination was not remarkable except for 3F hepatomegaly. Despite intravenous glucose and vitamins within 24 hours he developed typical delirium tremens. BSP on the second hospital day showed 20 per cent retention. This fell to 2 per cent within a few days. BUN on admission was 8 mg per cent and rose to 14 mg% with refeeding. Workup failed to reveal any of the usual causes of organic hypoglycemia.

CASE II: [REDACTED]

This 40 year old [REDACTED] woman a known chronic alcoholic and binge drinker, was brought to [REDACTED] in a comatose condition. Initially she was thought to have had a stroke but after the intravenous administration of 50 cc of 50 per cent glucose she became alert and all neurological signs of a cerebrovascular accident disappeared. Her blood glucose prior to administration was 25 mg per cent. The only pertinent history was that of a recent alcoholic binge during which time she did not eat but drank about a fifth of whiskey per day. Physical examination was not remarkable insofar as evidence of liver disease was concerned. Serum bilirubin on admission was 1.9 mg per cent and fell to normal in 2 days. BSP on the fourth hospital day showed 19 per cent retention. This fell to 10 per cent by the 6th hospital day. Liver biopsy was normal. Fasting blood sugars were normal.

One year later after drinking large amounts of whiskey for 2-3 days and not eating during the same period of time she was again brought to [REDACTED] in coma. Her blood glucose was 35 mg per cent and she again responded promptly to intravenous glucose administration. Three days of a 1200 calorie diet containing only 50 grams of protein and 50 grams of carbohydrate followed by one day of complete fasting and exercise resulted in fasting blood glucose concentrations of 72 and 70 mg per cent. BSP test showed only 4% retention. Serum bilirubin was 1.1 mg%. Workup for panhypopituitary or adrenal disease was negative.

CASE III: [REDACTED]

This 51 year old [REDACTED] was brought to the EOR in a stuporous state. Prior to becoming stuporous, he noted an episode of weakness, nervousness, and tremulousness. He lost consciousness, fell to the floor hitting his head and nose. On the EOR he was found to have a blood glucose of 18 mg per cent and responded immediately to intravenous glucose. He gave a long history of alcoholism and noted in the past two years many attacks of weakness and nervousness at times progressing to unconsciousness. These occurred during heavy drinking sprees when he had not eaten for several days. Physical examination revealed no evidence of pituitary or adrenal disease. Only an enlarged (3F + CM) non-tender liver was found. His BUN was 7 mg per cent and numerous fasting blood sugars ranged from 108 to 189 mg per cent, most values being over 120 mg%. His glucose tolerance tests were diabetic, the blood sugar at 3 hours being 400 mg per cent and at 6 hours 262 mg per cent. One brother had diabetes. After 36 hours of a Conn diet followed by 36 hours of fasting, his blood glucose was 102 mg%. Twenty-four hour 17-OH steroid excretion was 7.4 and 7.7 mg. Liver function studies were as follows:

T. P. with A/G = 8.7 with 5/3.7; Bilirubin 0.5 mg%; BSP 16% retention;
Prothrombin 11.5 sec.

He remained asymptomatic throughout his hospital stay and was discharged with the diagnosis of diabetes mellitus and ethanol-induced hypoglycemia.

ALCOHOL HYPOGLYCEMIA - CLINICAL PICTURE

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METABOLISM OF ALCOHOL

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MECHANISM OF ETHANOL-INDUCED HYPOGLYCEMIA

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II. ADDISON'S DISEASE AND DIABETES MELLITUS

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IV. PANCREATIC INSULINOMA AND DIABETES MELLITUS

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RATE of OXIDATION of ALCOHOL in Liver slices

mg ETOH/100 mg

Fed 0.66

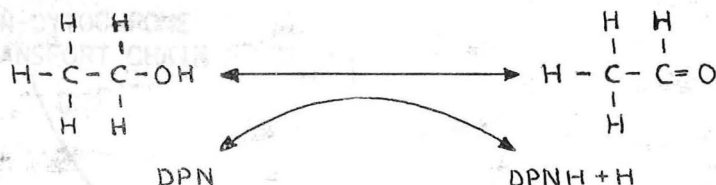
Fasted 24 hrs 0.33

Fasted 48 hrs 0.34

METABOLISM of ALCOHOL in the Liver

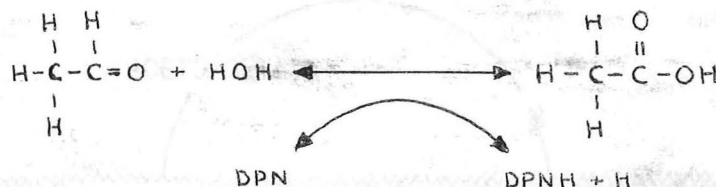
ETHANOL

ACETALDEHYDE



ACETALDEHYDE

ACETATE

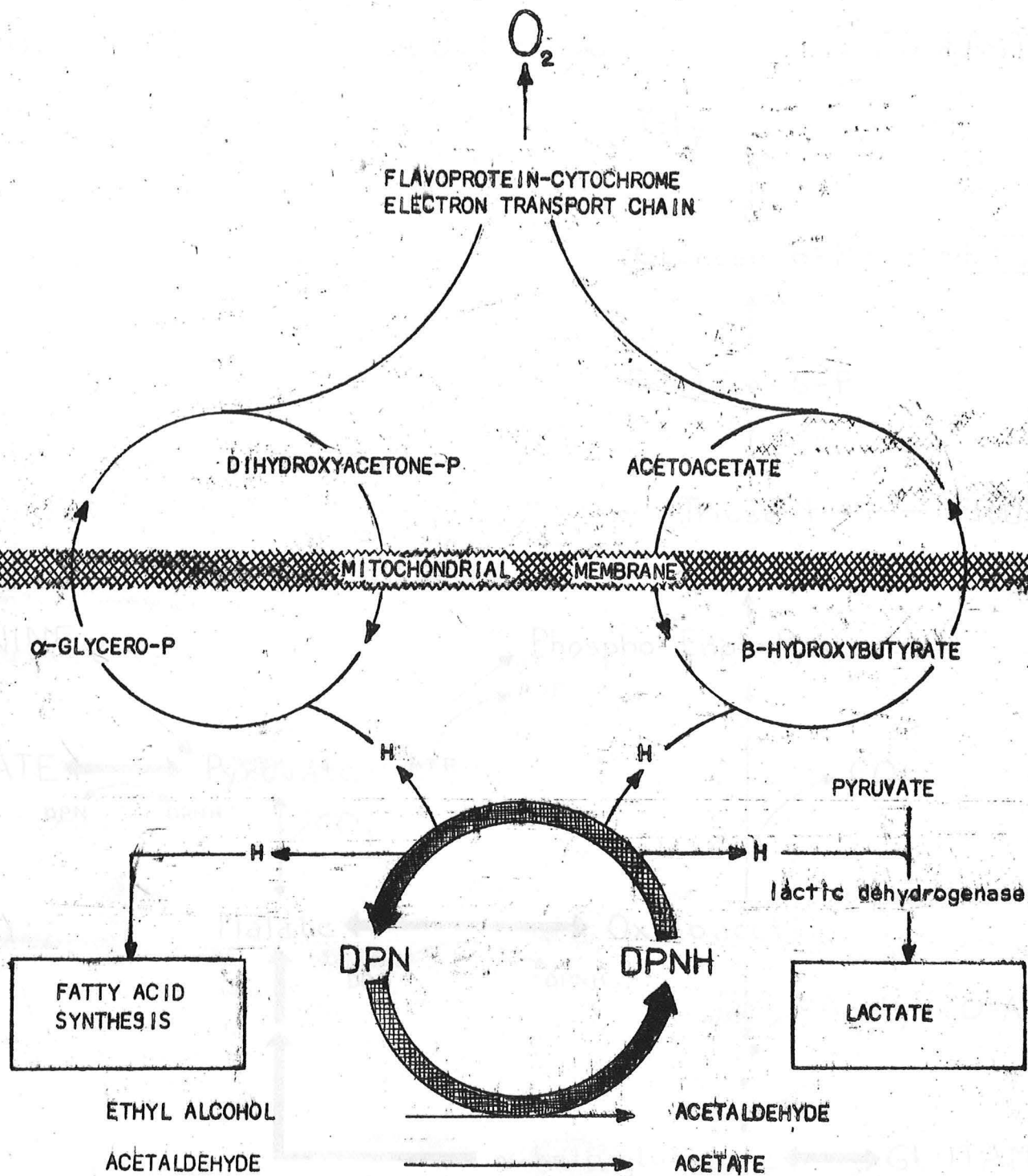


EFFECT of FASTING and ALCOHOL METABOLISM on DPN:DPNH Ratios in the Liver

	DPN:DPNH ratio	total DPN + DPNH Liver
Fed	1.69	5.80
Fed + ETOH	1.04	
Fasting	1.34	4.20
Fasting + ETOH	0.66	

MITOCHONDRIA

CYTOPLASM



Hepatic oxidation of ethyl alcohol and some of its metabolic effects.

SOURCES OF HEPATIC GLUCOSE DURING PROLONGED FASTING

