medical sciences

Gathered from the American Heart Association meeting last week in Atlantic City

GENETICS

Test for heart attack proneness

Because of an inherited disorder of blood lipids, certain individuals are predisposed to developing heart disease as adults. Preliminary studies by scientists at the National Heart and Lung Institute in Bethesda, Md., indicate that physicians will soon have a useful test for widespread screening of newborns to identify this disorder soon enough to institute prophylactic therapy, including diet and use of cholesterol-lowering drugs.

Dr. Peter O. Kwiterovich and his colleagues at the NHLI tested blood from the umbilical cords of 15 newborns having one parent previously found to have excess levels of beta-lipoproteins, which carry most of the cholesterol in blood. Of the 15, seven showed increased beta-lipoprotein levels when compared to 36 controls. Subsequent clinical studies of these patients and of another group of 265 children and young adults with such excesses indicated that combined diet-drug therapy could reduce lipoprotein blood levels by as much as 50 percent. This would put beta-lipoprotein into the normal range.

In a related study, Drs. Charles Glueck, Frank Heckman, Mike Schonfeld, Paula Steiner and William Pearce of the University of Cincinnati screened 1,660 newborns for evidence of the inherited lipid disorder. They found it in one in every 200 live births.

PHYSIOLOGY

Isometric exercise bad for heart patients

Isometric exercise—exertion without motion—puts a severe strain on diseased hearts, according to Dr. Charles Kivowitz and his colleagues at Cedars-Sinai Medical Center in Los Angeles. The research team studied 22 patients who were asked to maintain a forceful grasp on a hand-grip squeezer. All, Dr. Kivowitz reports, showed increased blood pressure and heart rate. In severely diseased patients, isometric exercise led to an increase in heart size and in the heart's oxygen requirements while simultaneously decreasing cardiac output.

Dr. Kivowitz collaborated with Drs. Harold Marcus, Roberto Donoso, William Ganz, H. J. C. Swan and William Parmley in his investigation.

PHYSIOLOGY

Stress linked to coronary disease

Evidence supporting the presumed association between emotional stress and heart disease is reported by a team of scientists from the Columbia University College of Physicians and Surgeons who have been experimenting with dogs and cats.

Dr. James W. Correll, with Drs. Gerda Mayer, Anibal Romero and Roger W. Countee, electrically stimulated two regions of the brains of dogs and cats one to two hours after feeding them a fat-rich diet. Through implanted electrodes they activated the hypothalamus, which governs such functions as urination, blood pressure regulation and sleep, and the amygaloid nucleus, which influences emotional responses including rage and fear. They report that during stimulation, lasting no more than four minutes, clear plasma turned milky from an increase in levels of a class of lipids known as triglycerides. The mechanism of this action, they explain, remains to be determined.

BIOCHEMISTRY

Clearing the bloodstream

In order to maintain a normal balance of lipids in blood, the body enzymatically breaks down circulating fats so that they can be stored in adipose tissue until they are needed as fuel. The principal enzyme in this process is called lipoprotein lipase.

Now, working independently, two teams of researchers have further elucidated this metabolic system by zeroing in on a potent protein which triggers lipase activity. A newly identified protein, apo-LP-glutamate, one of several small proteins in lipoprotein (fat and protein) molecules, appears to be a direct promoter of lipase action, they find.

The studies of apo-LP-glutamate were reported by Dr. John C. LaRosa of George Washington University, collaborating with Drs. Robert Levy, Peter Herbert, Samuel Lux and Donald Frederickson of the National Heart and Lung Institute and by Drs. Richard Havel and Dennis Bier of the University of California Medical School in San Francisco, working with Drs. Virgie Shore and Bernard Shore of the Lawrence Radiation Laboratory in Livermore.

VASCULAR PHYSIOLOGY

Growing new heartlines

When the coronary arteries are clogged by disease, and the heart as a result receives a reduced supply of oxygen, dormant small vessels in surrounding tissue may come into use as adjunct arteries. Dr. Wolfgang Schaper of the Janssen Research Foundation in Beerse, Belgium, reports clues to the mechanism by which these small but auxiliary vessels are pressed into service.

In experiments with pigs and dogs, Dr. Schaper implanted a constrictive device to close the largest coronary artery for two to three weeks. By the end of that time, he reports, a system of collateral vessels was fully operative in delivering oxygenated blood to the heart. Then the Belgian investigator injected radioactively labeled H^3-thymidine into the animals and subsequently removed small sections of the collateral vessels. He found that the thymidine, a precursor to DNA, had been taken up by a majority of cells in the vessel tissue, indicating they were preparing for cell division, leading to growth of that vascular system. Oxygen deprivation, he concludes, stimulated DNA synthesis and, hence, vessel growth. In some cases, the vessels grew to 10 times their previous diameter, enabling them to carry 45 times as much blood to the heart.