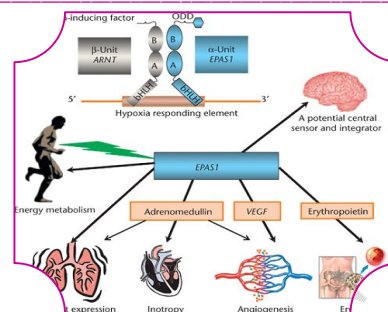




IMPACT OF GENES AND ENVIRONMENT ON SPORTS PERFORMANCE

Naseem Ahmed Khan
MPGC LKO



ABSTRACT

One of the most complex and enduring controversies in Science and Medicine is the nature – nurture debate.

These are two theoretical but very strong arguments, presenting two opposing view points where hereditary and environment account for variation in health and performance.

KEYWORDS: Science and Medicine , strong arguments , environmental influences.

INTRODUCTION :

This concerns the extent to the role of genes and environmental influences add experience in a range of human behavioral context including athletic, educational and musical performance and achievement.

How environment and genetic constraints are related to shape up the performance in sports and athletics in a question of interest in many sports related fields like sports pedagogy and sports psychology.

How the genetic knowledge can be use for the performance enhancement in sports, may attempts have been made.

Sports activities are basically governed by both genetic and environmental factors. Many Physical traits help determine an individual's athletic ability, the strength of the muscles used for movement (skeletal muscles) and the predominant types of fibers composed them.

As skeletal muscles are made up of two types of muscle fiber : slow twitch muscle fiber and fast twitch fiber slow twitch fibers contract slowly but can work for a longer time with out truing. These enables endurance activities like long distance cycling or running.

Fast twitch fiber contract quickly but true rapidly these are good for sprinting and strength activities.

Other traits include the maximum amount of oxygen a body can deliver muscle mass height, flexibility, coordination etc. Many studies have investigated variations in specific genes thought to be involved in these traits, comparing athletes with non athletes.

The best studied genes are ACTN3 and ACE. These are linked to the endurance and strength.

ACTN3 gene gives instruction for making a protein called (alpha) actinin-3, which is predominantly found in fast twitch muscle fibers. A variant in this gene called R577X leads to the production of abnormally short actinin-3 which is quickly broken down.

Some people have this variant in both the copies of the gene – genetic pattern (geno type) is 577XX. These have complete absence of α actinin-3 which appears to reduce the proportion of fast twitch muscle fibers and increase the proportion of slow twitch muscle fibers.

This gene type is more common in runners and long distance cyclists. The 577RR gene type is associated with high proportion of fast twitch fibers and is seen more commonly in athletes who rely on strength and speed (short dist. Runners). The ACE gene provides instruction for making a protein called angiotensin converting enzyme which converts a hormone called angiotensin I to another form angiotensin II. It helps in control blood pressure and influence skeletal muscle function.

Many other genes with diverse function have been associated with athletic performance. Some genes are involved in the function of skeletal muscles while others play a role for production of energy and communication of nerve cells and also some other cell processes.

Different examinations have inspected variety over the whole genome to decide if particular territories of genome are related with physicality.

More than 150 different variations linked to athletic performance. It is likely that a large number of genes are involved but only a few makes the difference in the performance.

Role of the Environment :

Athletic performance is also influenced by the environment.

- Factors such as amount of support a person receives from his family, coaches and friends.
- Availability of resources.
- Age
- Economic conditions

All these factors play an important role in the athletic performance.

It is not a simple task to tease apart the effect of the environment and genetic individually for example if a child and his/her parent excel at a sport, is that similarity due to genetic factor passed down from parent or is this due to the similar environmental factors.

It can also be a combination of the two.

It is certain that both these factors play a powerful and combined role.

An essential test when endeavoring to portray the impact of hereditary factors on athletic execution is its multi practical nature.

Each game has remarkable physical prerequisite and these can be diverse between the games. So any investigation of the hereditary effect on the execution must think about the execution segments. Most proper for the game of intrigue. Considering the quantity of body frameworks that must interface (muscle skeletal, cardiovascular, breaths, anxious, and so on.) athletic execution is a standout amongst the most unpredictable human qualities.

Maybe the principal noticeable distinction between the competitors of various claims to fame is in the body morphology (tallness + body structure) with explicit body types suited to particular games.

Other factors are endurance, strength and power are the primary factors under laying athletic performance.

High-impact perseverance i.e. capacity to continue a vigorous exertion after some time, for example, separate running or cycling essentially it requires the capacity of the cardio vascular framework to convey oxygen to the working muscle. It depends solely on maximal rate of O₂ uptake (V_{O₂max}). However V_{O₂max} : does not perfectly correlate with endurance performance. Some different factors, for example, economy and ventilatory limit likewise impact the execution.

Strong quality is the capacity of the muscle to hereditary power. Muscle quality and power are basic in athletic occasions, for example, run, hopping and weight lifting.

Different components are subjective elements and damage powerlessness. Environment plays a powerful role and it influences many of the above traits.

The general significance of condition versus hereditary factors on the athletic achievement likely fluctuates broadly between games also.

First class athletic status in this manner results from the communication of an ideal mix of hereditarily determined physical and mental qualities with the perfect condition for athletic achievement.

Whatever degree do qualities decide athletic capacity :

Nobody knows the particular response without a doubt. Most research proposes that hereditary qualities contribute fundamentally to sports execution however difficult to put a number on. There is a type of heritable segment to an attribute disclose to us that something can be passed in a family that can add to an execution.

There are two hundred genes we are cataloging as having some positive association with fitness related performance. The genetic factors are related to wide range of factors because sports performance is very complex. There are numerous issues out there are qualities screening and whether we can foresee execution or by one way or another tailor exercise or preparing advancement to specific individuals or select the games they partaking ahead of time. The other is whether we can adjust the hereditary profile to improve the execution. It is by all accounts a dim zone in light of the fact that there are more concerns notwithstanding seeking after it and no proof that it would truly work.

REFERENCES :-

- Ahmetor-II, Egorova ES, Gabdarkmanova LJ, Fedotovska ya ON, Genes and athletic performances An update med sport sci.2016.61:41-54 doi 10.1159/000445240@pub 2016 june10 Review pub. M: 27287076.
- Webborn N, William A, McNamee M, Bouchard C, Pitsiladis Y, Pigozz F, Wang G, direct to consumer genetic testing for predicting sports performance and talent identification : consensus statement Br.J sports med.2015 Dec.49(23),1486-91,doi.10,B6 I bj sport 2015-095343,pubme : 2 central: pub mad27287074.