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Difference between A1 and A2 milk: Risk of A1 milk

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ABSTRACT

Milk is a primary source of nutrition for infants after the birth and also for human beings. Generally, milk is either from humans (women) or from cattle origin they contain various types of proteins, vitamins, minerals and so on. Components in milk show various beneficial actions in beings and some of the studies found that metabolites of it show severe adverse effects like SIDS in the case of infants, gastrointestinal problems, cardiac problems and some other life threatening effects. They are various types of milk based on some strategy, not all categories of milk do cause harm but based on genetic variation in their chain shows its cause action, ,why this change has occurred in milk among them and action of the dangerous metabolites is explained In conclusion, the role of β-casomorphin in physiological functions remains controversial and more research with improved diagnostic techniques is needed to unravel the mechanism and study physiological functions of β-casomorphinand variation of the cow breads in world.

Keywords: SIDS, Casian, GLUP-2, BMC-7

INTRODUCTION

Humans depends on milk of cow mostly when we compare with that other being in early 19th century some of the researchers has found that some substance in milk which is from cow is causing problems to the human beings later in the end of 19th century some other analyst has found that milk is of various categories among them some commonly A1 and A2 is observed and they are mostly consumed by humans when we compare this two types of milk main difference between this 2 variants are position of amino acids in their chain. Mostly A2 milk breed cows are found in Asia mainly in south-east Asia especially in India and few regions of African region and A1 breed are found in the European, American and some others coming to the action of them when the milk is taken generally its gets break down into proteins and in case of the A1 milk in children causes SIDS and also some others chronic disease whereas the A2 milk from the Indian spices do produce but they gets hydrolated when it compares in this aspects A1 do possess 4 times higher than that of the A2.[1]A1 milk is produced by Holstein Friesian, Karan swiss, jersey and some other breeds which are common in European, American, Australia and A2 milk are produced by bos-indicus breed cows like Sahiwal, gir, red sindhi and some other.

Studies has found when milk is consumed orally they gets metabolized and gets fragmented into the pieces and it get absorbed into the cells some among them are not harmful whereas some of them are with the potentiality to cause harm such

as beta-casomorphin which is a seven numbered amino peptide which is mostly formed due to the A1 milk actually this happens due to some special enzymes which cut them from normal chain but in case of A2 this does not happened [2]actually this metabolites action has found recently because previously experimental studies has been done on the rabbits, rats and so on but that in most of the animal studies, BCM-7 was not administered orally, as humans would be exposed to it, but rather was given to animals by injection into spinal cord or brain and in sometimes even directly into peritoneal cavity , this makes studies not supporting for understanding how BCM-7 might affect humans. BCM-7 can also be created during the process by which cheese is made or fermentation of milk; those same processes can also destroy BCM-7.

Some demographics studies have confirmed that consumption of A1 milk leads to some effects like diabetes mellitus type 1, arteriosclerosis, coronary heart disease, schizophrenia and some other conditions.

Formation of BMC-7

When milk is consumed it goes into the stomach and there it breaks into fragments of proteins and amino acids they are absorbed into the intestine when we compare with various types of milk that are A1, A2, and humans. when we compare difference between A1 and A2 variants the position of amino acids in their chain is change that is in case of A1 67th place there will be histidine and in case of A2 proline will be where as humans and A2 milk will be almost same and they don't show any changes whereas A1 milk is taken into account they gets converted into the BCM-7 [3] which is a very potent substance that casesit can be represented by the following figure

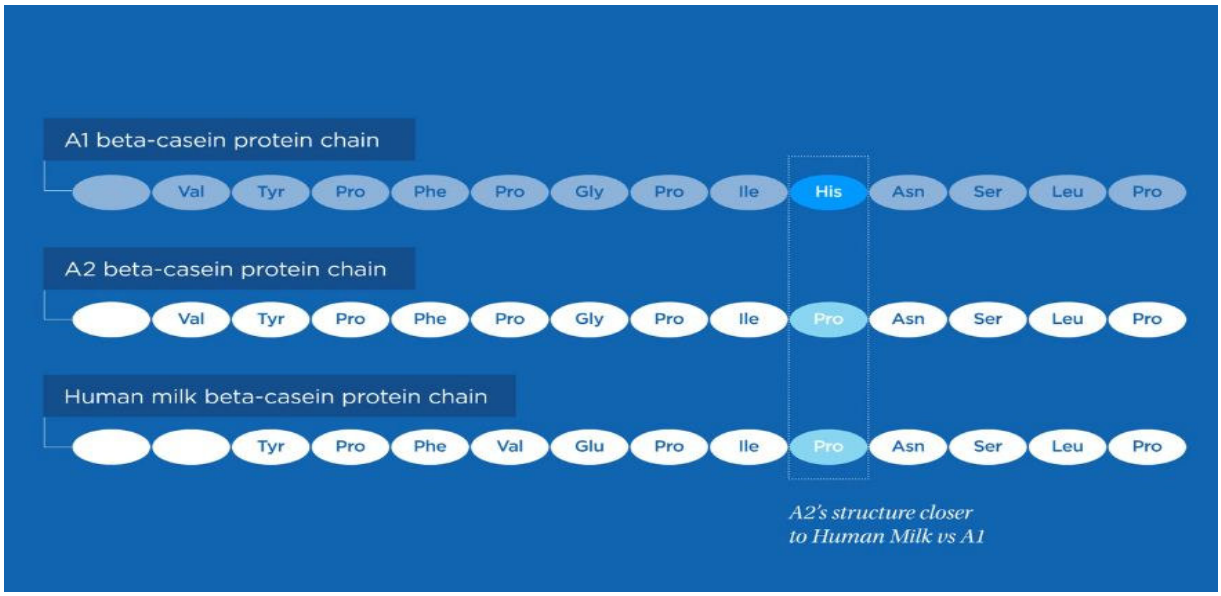

Fig1; Explains about the changes in milk in A1, A2, and human .in that comparison A2 and humans are same

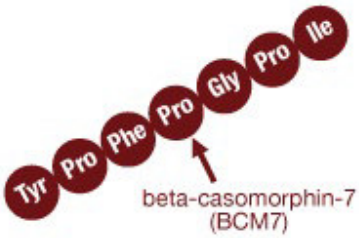

Fig 2; Structure of Beta casomorphine-7

Impact on Diabetes mellitus type 1

DMT1 is an insulin dependent diabetes mellitus in this case insulin is not produce in the body It may be due to the destruction of beta cells of the pancreas actually pancreas is the main gland in the production of the insulin to maintain the sugar levels in the body.

In the case of A1 milk, the product which is formed that is BMC-7 which is an opioid it shows the cross reactivity with that of the epitope of the pancreatic beta cell glucose transporter GLUP-2 as autoantibodies to GLUP-2 it leads to the destruction of beta cells of the pancreas. Whereas in the case of the prediabetic patients it causes some gut-related immune response and causes damages in some conditions it can treat with an opioid antagonist (naloxone).[4]

Impact on SIDS

Sudden infant death syndrome is a condition in which infants of below 12 months will death in their sleep it may be due to apnoea or may be related to apparent life-threatening events like the change in skin color, coughing, gagging. Actually, the reason behind this is BCM-7, a peptide which is having an amino acid sequence of Tyr-Pro-Phe-ProGly-Pro-Ile are primarily depraved by DPP4. DPP(dipeptidyl peptidase 4) is a protease that removes the N-terminal dipeptide from that of the peptides containing a Pro or Ala at the second position.DPP-4 is expressed on T lymphocytes.[5] [6]

A study on infants confirms that infants with life-threatening apnoea had markedly elevated BCM-7 levels whereas the DPP4 activity is lowered when it is comparedwith normal healthy infants [7] [8].

Impact on gastrointestinal tract

In most of the GI cases, BCM-7 acts as the μ-opioid receptor agonistic this causes the gastric motility, releases of hormones, constipation and so on. Some studies has said that BCM-7 causes the destruction of the gut immune system by damaging the lamina propria lymphocytes however this study has been opposed by some investigators**[**9**],[**10**],[**11**]**

BCM-7 shows the immunoreactivity towards the immunoglobulins-IgE, IgG. Recently few studies in 2014 has identified that immunoreactivity of the BCM-7 cause Food protein-induced enterocolitis syndrome (FPIES) [12][13]

Recently in 2014, a study was conducted in order to identify the role of IgA and TGF-beta specific to casein into milk a gastrointestinal hypersensitivity disorder in children. The study showed the minimal titer levels for IgG and IgA and absence of TGF-beta levels stating tGF beta as a possible biomarker whose lowering levels may indicate the person being affected by (FPIES). [14]

Impact in case of atherosclerosis

Effects of the A1 & A2 milk in human actually this study has been conducted in rabbits where the A1 milk has fed to some rabbits and A2 milk is given to some group of rabbits later reports has shown that the rabbits which have been fed with the A1 milk have shown fatty contents on the walls of blood vessels which may progress and causes severe cardiac problems like angina and etc. Whereas the A2 milk has does not shows such effects. A1 milk also has the potentiality to increase the number of low-density lipoproteins and to decrease the number high-density lipoproteins which is referred as the good cholesterol. Fatty traces are made up of foam cells while in the case of normal atherosclerosis develop from macrophages that have taken up ox-LDL. [15] In a damaged vessel.

The devouring of beta casein leads to aggravation of symptoms related to the autism and schizophrenia.[16]–[17] but These effects were imputed by the opioid activity of BCM-7 and to oxidative stress,[18] that leads to the neurological deficits that materialize as symptoms of autism and schizophrenia.[19]

(A) (B)

Fig 3: Difference between Holstein cow(A) and Gir cow(B)

(A) No hump, small ears, smaller flat forehead, small neck, table top hind legs posture
(B) Hump present, long and pendulous ears, convex forehead, round hind legs posture

The European Food Safety Authority reviewed some scientific literature based on the BMC-7 concept and published a review article in 2009 saying about the variations in milk and problems in it. Even through BCM-7 contains some useful effects but less

Actually, this problem has been occurred due to the mutation in the cow before thousands of years ago and cattle has been taken to western countries where the proline is replaced with histidine at position 67, spreading widely throughout the herds of the western world through breeding till now.[20]Whereas the Asian especially in subcontinental countries like India are with A2 milk producing breeds till 18th century only a few amounts of cows in India used to produce A1,but this has been changed in this century it may be due to increase the demand for milk in India, many of the herdsmen has shown interest in A1 milk producing breed cows like jersey, Karan swiss, Holstein breed cows especially this breed cows do produce more amount of milk when compare with that of A2 breed cows which happened with the help of White Revolution it introduced foreign cow breeds to India which are capable of producing bulk amount of milk and replaced the Indian cow.

In New Zealand and Australia now they started finding a solution to these problems by pushing the people to drink the A2 milk which may be a high cost for them.

CONCLUSION

Awareness programs need to be conducted and educate the herdsmen regarding the A2 breed cows. More studies, case reports and including randomized controlled trials, observational cohort studies, are needed to confirm the potential clinical benefits of reducing A2 beta casein

Milk Consumption. The government needs to take preventive measure for this.

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