Intestinal Alkaline Phosphatase Deficiency (IAPD) Causes Diabetes: A 5-Year Prospective Cohort Study

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Definition of Diabetes

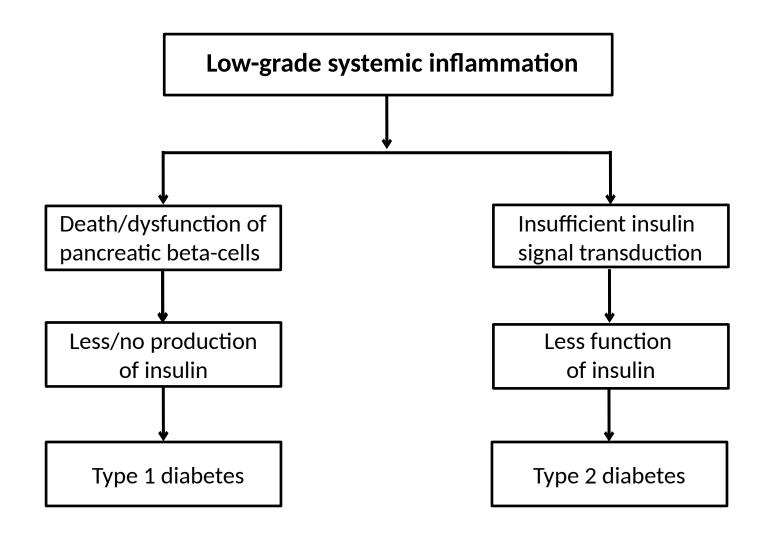
Blood sugar level: ≥126 mg glucose/100 ml of blood after overnight fasting Or ≥7.0 millimoles glucose/Liter of blood after overnight fasting Or ≥6.5% Hemoglobin A1c (HbA1c) in a random blood sample

Definition of Inflammation

Body's immune response to defend against harmful bacteria, viruses, toxins, etc.

Low-grade systemic inflammation : No physical signs and symptoms; diagnosed by presence of pro-inflammatory cytokines in blood, e.g., Tumor Necrosis Factor (TNF)-alpha, Interleukin (IL)-1beta

Direct Cause of Diabetes



Cause of Low-Grade Systemic Inflammation

Bacterial toxins (called endotoxins) lipopolysaccharides (LPS), Lipoteichoic acid (LTA) These toxins are fragments of cell-wall of dead bacteria in the gut and pass with stool (usually do not enter into blood), however, if you eat high fat diet, drink alcohol, cold drinks (high fructose) then these toxins enter into blood and cause low-grade systemic inflammation ultimately leading to the development of diabetes

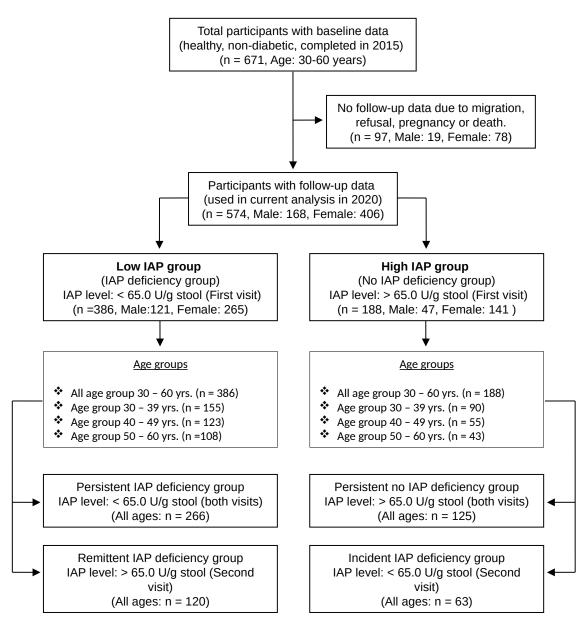
Body's Natural Defense against the Toxins

Intestinal Alkaline Phosphatase (IAP)

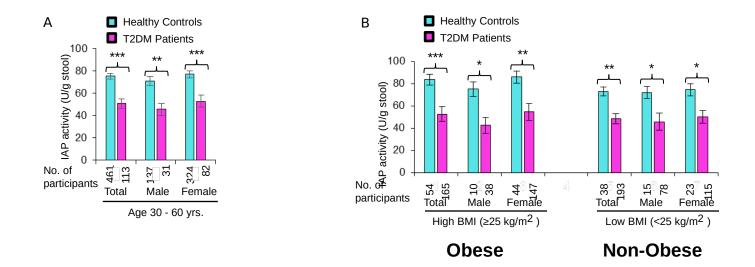
secreted by the cells (enterocytes) lining the small intestinal wall IAP destroys the toxins

Hypothesis: If you suffer from IAP deficiency (IAPD) then you will develop diabetes

Research Design of the Prospective Cohort Study

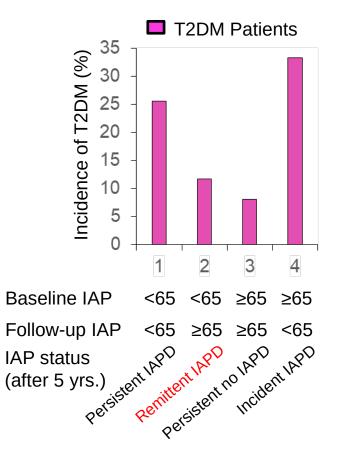


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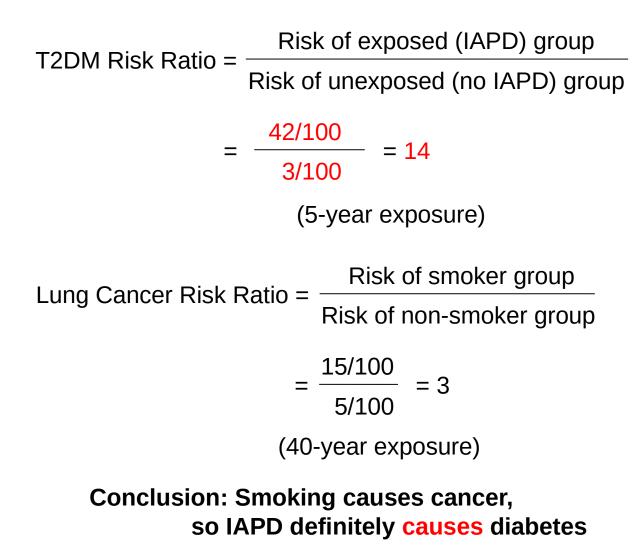
A high level of IAP is protective against diabetes irrespective of obesity

IAPD is associated with a higher incidence of diabetes

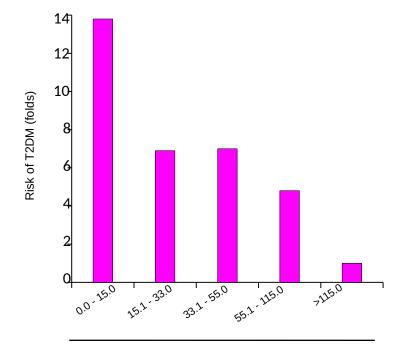


Note: Remission of IAPD (**Remittent IAPD**) prevents diabetes ns, not significant

Risk Ratio

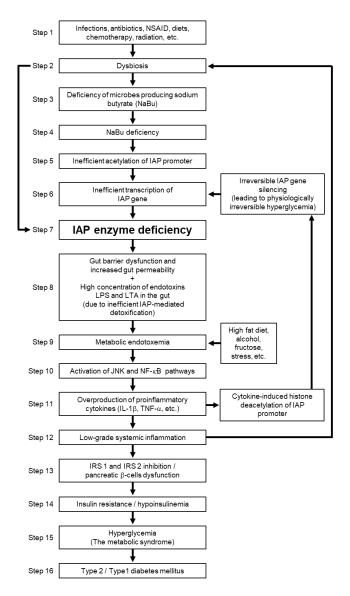


The lower the persistent IAPD the higher the risk of diabetes



Persistent IAP level (U/g stool)

Diabetes Pathogenesis Model



Summary

- 1. Human intestine harbors 100 trillion bacteria.
- 2. Fragments of dead bacterial cell-wall function as toxin (endotoxin); however, they usually pass with stool (do not enter blood circulation).
- 3. High fat diet, alcohol, cold drinks (high fructose), etc. allow toxins to enter blood.
- 4. Toxins in blood cause low-grade systemic inflammation affecting various organs.
- 5. Inflammation affecting insulin production causes type 1 diabetes.
- 6. Inflammation affecting insulin function causes type 2 diabetes.
- 7. Intestinal alkaline phosphatase (IAP) is produced by intestine (enterocytes) and it destroys toxins (functions as body's natural defense against toxins).
- 8. IAP deficiency (IAPD) increases toxin accumulation and toxins easily enter circulation causing low-grade systemic inflammation followed by diabetes (and probably ischemic heart disease (IHD) as inflammation also causes IHD).
- 9. Compared to people with no IAPD, people with IAPD have approx. 14 times higher chance of developing diabetes.
- 10. Remission of IAPD prevents diabetes.
- 11. Oral IAP supplementation would prevent diabetes.
- 12. People could be screened for IAPD (stool IAP, STAP test) and treated for prevention of diabetes.
- 13. Eradication of worldwide pandemic of diabetes (probably also IHD) is possible.

The Vital Question

Are you going to develop diabetes in the near future?

The Answer

Do the STAP test – know it today!

Availability of STAP test: As soon as the Government wants!!

(both lab-based and home-based STAP test kits are ready to be available to the public)

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