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Describe the changes in disease burden in Mexico especially with regards to diabetes mellitus type 2

Since the 1980's the burden of disease in Mexico has moved from malnutrition and infectious diseases to obesity, diabetes mellitus type 2 and other non-communicable diseases (NCD)[1]. In the 1950's NCD accounted for less than 1/3 of all mortality; now it is >90%[1]. Mexico achieved the dubious title of most obese country in the world in 2013, overtaking its northern neighbour the United States of America[2]. The incidence of diabetes has exploded in just 2 decades, and has become the second leading cause of death[1]. In Mexico City the prevalence is 15.5% but it is not only a disease affecting urbanised areas; the poorest rural areas are also severely affected[3]. Tragically, many children and adolescents are increasingly affected[3].

The rise of diabetes, obesity and other NCD is multifactorial. Undernutrition was prevalent in the 1980's; now calorie consumption has increased but a large portion of these calories comes from fizzy drink 'refresco' and junk food consumption, thus the transition to a different state of malnutrition[3]. Mexico now has the second dubious title of highest refresco consumption per head in the world[4]. The change of diet from traditional (tortilla, vegetables, beans) to fast food has also increased, whilst exercise has decreased[3]. Recently, genetic predispositions to diabetes have been described in Mexican/Latin American populations[5].

The cost of this diabetes is terrible; mean life expectancy following diagnosis is just 10.9 years, in addition to the disability caused and economic impact to the patient, their family and the state[1]. Control of diabetes in affected patients is usually poor; only 6.6% maintain a HBa1C less than 7%, the target, leading to the high mortality and complication rates[1]. This is likely due to a mixture of factors including a lack of access to good care and patient elements. Personally at the Hospital General de Guanajuato, I experienced that many patients were minimally engaged with their condition and its treatment. This was generally applicable to most long term conditions; patients were ignorant of their medication when asked and would not bring it with them, so many would spend their inpatient time without their regular medication. Patients with repeated HHS would report they continued to drink over 1.2L of refrescos daily, and would frequently stop their insulin injections for weeks/months. I felt patients did not feel they had or could have ownership over their condition, for example the language used by patients implied that they do not feel that they can influence their own blood glucose control. The mixture of the paternalistic style of medicine that predominates in Mexico, the sentiment often expressed that their lives were in God's hands and lack of education seemed to combine producing poor motivation and adherence.

Describe the health system in Mexico

Mexico began to introduce a universal health care system in 2001 and country wide coverage was achieved in 2012[6]. However, 3 different unequal systems of health care coverage are in operation, in contrast to the UK where NHS care is provided equally to all, irrespective of means. Patients attend different hospitals for their care depending on the insurance policy they have. All 3 systems are tripartite in theory; the first system is ISSTE, for state employees, the second, IMSS is for employees of the private sector; the employee, employer and state all contribute to the insurance[6]. The Seguro Popular, first introduced in 2001, aimed to ensure the 44 millions of Mexicans without insurance were covered, including many millions of children; by 2012, 88% of the target population had enrolled. It is financed by the state and federal governments, whilst contributions by the persons covered are means tested; the majority make no contribution at all[1]. Patients cannot be excluded from insurance with Seguro Popular due to pre-existing conditions. The diseases and treatments covered by Seguro Popular continue to be expanded, nevertheless, patients may still experience financial hardship due to medical costs. For example, patients must purchase at subsided cost the orthopaedic materials such as rods, plates or hip replacements needed in repairs of hip fractures or other bones which can be difficult for them to pay for.

Nevertheless, the Seguro Popular has given millions access to care, and is credited with facilitating improvements in survival of numerous diseases, including childhood cancers such as ALL and in diabetes control compared to the uninsured[6].

Even for the uninsured, access for medical care covering certain things is universally free, such as basic pregnancy care and medication such as folic acid, and a childhood vaccination programme covering 12 infections[6].

The Hospital General de Guanajuato saw patients without any insurance, but the majority were enrolled in the Seguro Popular. Diabetes continuing care is covered by the Seguro Poplular; patients should be followed up by their Centro de Salud, where a primary care service is available for monitoring of HbA1C and weight. Regular screening for complications of diabetes, such as retinopathy, nephropathy, and neuropathy is not available. The range of medications offered for diabetes with the Seguro Popular is also more limited than in the UK; metformin, acarbose, insulin nph are offered, and importantly, cover for the treatment of complications is restricted too. Therefore most patients who are not controlled with first line metformin go straight onto insulin too.

Compare public health initiatives in combatting diabetes and obesity in Mexico to the UK

Public health initiatives in Mexico have involved public campaigns, industry regulation through new laws and expansion of public health services. By 2000, the Mexican government began to organise campaigns to address inactivity, unhealthy diets, with some similarities to the UK Change for Life campaigns, and a slowing in the increase in obesity was noted in 2006[2].

The Coca-Cola Company in Mexico owns over 75% percentage of the drinks market, including bottled water[4]. Therefore it essentially controls the prices of refrescos as well as bottled water, which is important as tap water is unsafe to drink. In many places, Coca-Cola is cheaper than bottled water; for a poor family it is easy to see why they choose a flavoured drink of 12 pesos/ litre (approx.

50p). Given the role of excessive refresco consumption in obesity and diabetes mellitus, a tax of 1 peso per litre of refresco was implemented in 2012 to try to reduce consumption[2]; it's effectiveness as yet is unknown. At its implementation Coke responded by threatening job losses, however it is commendable this law was passed in the face of industry pressure. Large campaigns across Mexico City during 2012, in particular on the underground, highlighting the dangers of diabetes and quantities of sugar in refrescos also sought to improve education and awareness[8].

A law encouraging the self-regulation of the junk food industry including restrictions on the sale of refrescos and junk food in schools was introduced in 2013[2]. A study looking at the response of multiple-stakeholders including health professionals, parents and industry found that health professionals and parents were positive about such a move, hoping it would have an impact on obesity, whilst industry responded negatively, again threatening it would cost jobs and predicting that it would have no effect on obesity as the responsibility lay with the families[9]. Actually, on implementation many food posts simply moved outside the school gates. Similarly in the UK, schools have been encouraged but not legally banned from selling junk foods. In the borough of Tower Hamlets, proposals to ban the opening of additional junk food shops within a certain radius of schools or to ban sales to children around the hours of school closure were met with stiff resistance, also for supposed economic reasons.

In addition to campaigns and legal activity, the Mexican government has also expanded the preventative and detective efforts of the health system to combat diabetes. An element of the Seguro Popular has been to introduce a 'Consulta Segura' when registering or at renewal- essentially a check-up and assessment of modifiable risk factors to assist with the prevention of disease or at least early detection[1].

Interestingly, due to the huge burden of diabetes in Mexico, in March 2014, a programme in partnership together with University College Hospital, Novo Nordisk and the government of Mexico City got underway to gain a handle on diabetes in Mexico City called 'Cities Changing Diabetes'[3]. It will be exciting to see the results of their research, initiatives and results in the years to come.

Improve skills in managing acutely sick patient and consider impact of resources during emergency management

As in the UK, the majority of patients presenting to A&E are not emergencies, but during my time in A&E department, I felt I improved my assessment of when a patient was more seriously ill. I saw a wide range of conditions; from conditions also common in the UK, (HHS presented almost daily) to presentations we don't generally see in the UK, such as scorpion stings, and rattlesnake bites. I frequently had the opportunity to suture, apply casts and also to reduce a dislocated shoulder under supervision. The birth rate is high and assessment of pregnant women and children was far more common than in my London placements.

The A&E department has reasonable resources, however there were a few things which certainly made assessment of patients harder. For example, only a Pinnard was available instead of an ultrasound device for detecting fetal heartbeats, the ECG machine used suction caps at the end of the leads instead of sticky pads which were sometimes difficult to apply in an emergency and the lack of a CT machine prevents urgent assessment of strokes and head injury in particular.

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