of the identified rearrangement. Therefore, these assumptions underline how an initial clinical diagnosis of a malformative syndrome has led to an unexpected laboratory result, which changed patient reproductive perspectives, permitting an accurate genetic counseling and subsequently the opportunity of offering an early prenatal diagnosis in the future.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Acknowledgments.—We would like to express our gratitude to the patient and her family, which made this report possible.

Article first published online: April 12, 2018. - Manuscript accepted: March 8, 2018. - Manuscript revised: October 20, 2018. - Manuscript received: June 1, 2017.

(*Cite this article as:* Pascolini G, Valiante M, Majore S, Cariola F, Laino L, Calvani M, *et al.* Incidental finding of an Xq microdeletion in a girl with trichorhinophalangeal syndrome type I harboring a novel *TRPS1* nonsense mutation. Minerva Pediatr 2018;70:639-42. DOI: 10.23736/S0026-4946.18.05011-9)

Online version at http://www.minervamedica.it
Minerva Pediatrica 2018 December;70(6):642-3
DOI: 10.23736/S0026-4946.18.05386-0

Lifestyle factors among adolescent

Wang *et al.*[1] found that metabolic syndrome in children and adolescents is linked to unhealthy lifestyle practices.

This paper has given us the opportunity to discuss the need for prevention and the ways of carrying it out.

Unhealthy lifestyle during adolescence predisposes the subject to cardiovascular, neoplastic and addiction.

An unbalanced diet, alcohol consumption, smoking, substance use and too little exercise are all often characteristic of many teenagers' lifestyles. Alcohol consumption (especially binge drinking) during the adolescent period leads to weight gain, fatty liver disease and, subsequently, insulin resistance. Metabolic syndrome, alcohol abuse and a sedentary lifestyle are often associated conditions.

In many parts of the world, these problems are growing, demonstrating that the prevention programs which have been implemented so far have not substantially changed this negative trend.

Eighty percent of cardio-vascular events could be prevented, as well as 90% of cases of type 2 diabetes. Approximately 35% of the world's population is overweight and the prevalence of childhood obesity is estimated to reach over 9% by 2020.[2]

During this period there has been cultural deprivation. This phenomenon must be balanced out by the cultural empowerment of individuals. This empowerment is essential in order to resist environmental pressure.

To achieve maximum effectiveness, we think that prevention programs should start during the period before full adolescence. This proposal is based on neuroanatomical and neuro-functional evaluations.

First of all, it is known that the development of the prefrontal cortex continues beyond the age of twenty.

The dorsal-ventrolateral cortex and the medial temporal lobe (including the hippocampus and amygdala) undergo significant changes from late childhood and lasting into adulthood. During the first two decades of life, the gray matter in the frontal cortex decreases significantly, while there is an increase in the temporal structures.

Cross-sectional and longitudinal studies have shown a thickening of the neocortical structure from 15 years of age onwards. This is mainly due to the glutamatergic synapses. In the brain's temporal lobe (the hippocampus) the increase is due to the reinforcement of myelination. It is important to emphasize how during adolescence these anatomical modifications are associated with the protracted maturation of the working memory and increased emotional regulation.[3]

During childhood, these modifications interact with social, cultural and educational environments.[4]

Some studies on twins have shown that up to 14 years of age, genetic predisposition is much less influential than the environment (education, examples etc.). At the

age of 16, these two factors are in balance. Subsequently, genetic predisposition, instincts, emotions and transgression are stronger than environmental factors. Dick *et al.*[5] showed, for example, how at 14 years of age, parenting education has a significant containment action compared to smoking. The more the parental influence increases, the less the two boys were inclined to smoke. However, during the next few years the adolescents had a greater propensity to follow their peer group.

For these reasons, in order for prevention programs to be effective, they have to start during the period before full adolescence.

Bundy *et al.*[4] claim that "well designed health interventions in middle childhood and adolescence can leverage the current substantial investment in education."

To date, many prevention initiatives have highlighted some shortcomings:

- often, they are "spot" activities that reach only a small number of children, thus creating information inequality;
- only some aspects of prevention are addressed (nutrition, alcohol, illegal drugs, sport);
- the boys are almost always reached via information, and even then, only partially;
- all the innovative models are carried out experimentally and, in any case, they always only reach a tiny number of students;
- not all of the subjects who are carrying information have a sufficient "scientific curriculum." It is known that personal opinions do not count, rather it is scientific evidence that must underpin the primary prevention programs and health promotion. For this reason, a "common language" between the various trainers is often lacking. In this way, there might be more damage than benefits;
- the ages of the children reached are not always the right ones.

Although there is a lack of clear data evaluating the sustainability and long-term effectiveness of programs targeting adolescents, some significant and verifiable results through objective parameters have been partially outlined and are mainly characterized by the following elements: 1) the development of personal, social and rejection skills in order to resist pressure; 2) a reduction in social and health problems in young adults; 3) an improvement in the overall quality of life; 4) better academic performances and more academic success and, in any case, greater success in their emotional and working lives.

In our locality, the "educational" proposal ("an education to correct lifestyles") is as follows: The involvement of children aged 9-13 years old; general information is given to the students by their health teacher; training groups of students who are predisposed to divulgate activity. A qualification certificate must be issued to the students from their "lecturer on lifestyles," as well as related training school credits; this is followed by "peer education"; then the reference teacher becomes "a facilitator"; this activity must be repeated more than once a year (8-10 sessions during the first year with 3-5 recalls later); this activity must be included in the training curriculum with periodic checks in subsequent years; the parents must be actively involved through face-to-face meetings or via information technology; finally, informative material must be distributed to the students' families.

Unlike other risk factors, food education should start immediately and, above all, the parents should change their lifestyles when planning a pregnancy.

The main aim is to help children to learn the ability to think and, most importantly, to help the weakest children to acquire tools to achieve a free and authentic life. This means a life that is indifferent to messages from the majority, which are not always correct, as well as to the media and advertising pressure. We must strive to teach our young people the ability to recognize external pressure and to develop those cognitive abilities that can resist this level of pressure.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Article first published online: October 4, 2018. - Manuscript accepted: September 6, 2018. - Manuscript received: July 25, 2018.

(*Cite this article as:* Balbinot P, Fagoonee S, Pellicano R, Testino G. Lifestyle factors among adolescent. Minerva Pediatr 2018;70:642-3. DOI: 10.23736/S0026-4946.18.05386-0)