UNNECESSARY HEALTH CARE

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Overutilization, overuse, or overtreatment and quaternary prevention

The black hole in pediatrics

Introduction

In our daily business, unnecessary healthcare is not obvious. But already in 2010 the US Institute of Medicine (IOM) called attention to the problem, suggesting that «unnecessary services» are the largest contributor to excessive healthcare costs, accounting for approximately $ 210 billion of an estimated $ 750 billion in excess spending each year[1]. In previous studies of different medical subspecialties, 30% of inpatient antimicrobial therapy[2], 26% of advanced imaging[3], and 12% of acute percutaneous coronary interventions were found to be unnecessary or inappropriate[4]. The US academy of sciences estimated in 2005 that «between $ 30 and $ 40 of every dollar spent on healthcare is spent on costs poor quality healthcare, wasted on overuse, underuse, misuse, duplication, system failures, unnecessary repetition, poor communication and inefficiency»[5]. While similar statistics are lacking for the pediatric field, the hypothesis is that the same applies to our field, thus attributing a rough estimate of 30% of pediatric services to medical overuse. Interestingly though, our textbooks hardly ever mention the problem of medical overuse – be it the latest Nelson 2016, Wolters Kluwer's UpToDate Inc., or the Swiss «Paediatrica». Reducing overtreatment is essential for improving patient-centered care[6], as it is directly associated with patient harm, overuse of diagnostic testing and the inherent postoperative complications from unnecessary surgical procedures[7]. This article seeks to raise awareness of the possibility of medical overuse through overdiagnosis in pediatrics, suggesting that overdiagnosis may affect commonly diagnosed conditions and focusing on a possible remedy, the quaternary prevention.

A literature search and systematic review of studies that address overuse in pediatric care by Coon ER 2017[8] identified ten areas of overdiagnosis, overtreatment, and over-utilization:

1. Lowering oxygen-saturation thresholds to 90% for infants with bronchiolitis can safely decrease lengths of stay.
2. Children with isolated linear skull fractures and normal Glasgow coma scale scores do not require hospitalization for observation or re-imaging.
3. Using antidepressants in adolescents is likely ineffective and possibly harmful.
4. Most (70% to 80%) of hospitalized children with community-acquired pneumonia have a virus or mycoplasma as causative pathogen, not bacteria.
5. Oral antibiotics are as effective as, and much safer than, peripherally inserted central catheters for the treatment of acute osteomyelitis.
6. The exchange transfusion threshold for infants with hyperbilirubinemia is likely too low and should be raised because the risk of cerebral palsy and kernicterus is extremely low.
7. Nebulized hypertonic saline is not superior to normal nebulized saline for management of inpatient bronchiolitis.
8. Routine measurement of head circumference in the first 2 years of life is neither sensitive nor specific for neurocognitive disorders.
9. Using C-reactive protein testing to screen for early-onset sepsis in newborns resulted in longer hospitalizations and more lumbar punctures – but no improvement in outcomes.
10. In evaluating acute appendicitis, replacing computed tomography with ultrasound reduces radiation exposure and provides the same or better accuracy.

Other examples with scarce evidence until now, could be added to this list: unnecessary antibiotics in middle ear infection, antibiotics in vaccinated children with suspected pneumonia, antitussive drugs, mucus solvents, antibiotics in strepococcal pharyngitis, overuse of steroids in asthma, overtreatment with levothyroxine in congenital hypothyroidism, overtreatment of fever (a daily problem), overuse of stimulants, excessive antibiotics in Lyme disease, treatment of aspiration, antibiotics in suspected bacteremia, improperly diagnosed food allergy, gastro-esophageal reflux, threshold of hyperbilirubinemia and hypercholesterolemia, hospitalization for hypoxemia in bronchiolitis, medium-chain acyl-coenzyme A dehydro-

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genase substitution[9], excessive multiple drug regiments in epilepsy (treatment of EEG instead of children), to name a few.

Overdiagnosis for adult conditions has gained a great deal of recognition over the last few years, and led to realizations that certain screening initiatives, such as those for breast and prostate cancer, may be harming the very people they were designed to protect. Although some initiatives exist already like «smarter medicine» or https://www.choosingwisely.org/topic-area/pediatrics, overdiagnosis in children has been less well described, or looked after.

Definition

Overdiagnosis is defined as a diagnosis of a condition or abnormality which will, if left alone, never cause symptoms, complications, or shortened life, while in overtreatment, by definition, treatment cannot possibly help patients who are overdiagnosed[10]. Overuse comprises both overinvestigation and overtreatment. Examples are over-utilization, over-prescription, self-referral, manipulation of cut-off values, diagnosing non-disease and inappropriate healing claims.

Overdiagnosis occurs when a diagnosis is «correct» according to current professional standards, but the diagnosis or its associated treatment has a low probability of benefiting the person diagnosed. It is caused by a range of factors such as: use of increasingly sensitive tests that identify abnormalities that are harmless, non-progressive, or regressive (over-detection), expanded definitions of disease – for example, attention-deficit/hyperactivity disorder and dementia – and lowering disease thresholds, such as osteoporosis (over-definition), creation of pseudo-diseases (also called disease mongering), such as low testosterone and restless leg syndrome.

Causes

The basic premise – that medicine is driven by science and by physicians capable of making clinical decisions based on well-established facts and theories – is simply incompatible with the data. It is obvious that care providers are more important in driving demand than previously thought[10]. For example, pharmaceutical industries don't look for patients but for consumers. Possible drivers on the patient side are culture, beliefs (more = better), faith (in doctors and in prevention), the intolerance of uncertainty, biased media (advertising), medicalization and offers by the sellers. An impressive example of the latter is the opioid crisis in the USA[11]. Others are introduction of new «quality measures», increased complexity of care, new guidelines (e.g. cut-off values for dyslipidemia), and screening. Another phenomenon not only occurring in developing countries is «because we have the machine»: unnecessary examinations are performed because the capacity is there. Meanwhile, in disease mongering, the defining limits of illness are widened and so is the market for it (stimulants). This successfully transforms healthy people into patients, with the Munchhausen by proxy syndrome as grateful teammate of this malignant mechanisms.

An important reason for these phenomena is the clinician's fear of missing a diagnosis or litigation and/or public enthusiasm for screening or testing and desire for reassurance. But the main reason probably are financial incentives on all levels: doctors, health insurances, hospitals and government. The potential consequences of overdiagnosis are psychological and behavioral effects of disease labelling, physical harms and side effects of unnecessary tests or treatments, thereby lowering the quality of life affected by unnecessary treatment and increased financial costs to individuals and public health care.

Factors that drive medical overuse include paying health care providers more to do more, exaggerated fear of litigation or patient's litigiousness, and the consumer's unawareness of healthcare costs due to insurance coverage (whether public insurance, private, or both). Such factors leave many actors in the system (doctors, patients, pharmaceutical companies, device manufacturers) with insufficient incentives to restrain prices or overuse. The threshold between necessity and lack thereof is often subjective and based on biased studies e.g. by pharmaceutical research sponsoring. The latter is prone to publication bias, omitting negative study results, which can lead to unnecessary if not downright dangerous «treatments» as it was the case with Tamiflu®. Often patients ask for drugs, devices, diagnostics, or procedures purely based on advertisements, mostly lacking any scientific basis. Service providers will simply give these treatments or services rather than attempting the more unpleasant task of convincing the patient that what they have requested is not needed or likely to cause more harm than good. There are distinct traps for physicians, predisposing to over-treatment[12]:

- attempting to mitigate a risk of a disease without considering how small or unlikely the potential benefit is
- attempting to fix an underlying problem, instead of using a less risky monitoring or coping strategies
- acting too quickly, when waiting for more information might be wiser
- acting without considering the benefits of doing nothing
- suspecting a wish of the patient, or his parents, do to something
- following unproven rules or eminence-based advice
- believing (hoping) instead of knowing
- intolerance of uncertainty

- biased media and literature (e.g. publication bias)
- trend to global medicalization
- ignoring the downsides of diagnostic testing
- being a victim of direct marketing
- fearing that patient will change health provider if I am not willing to follow his wishes
- «new is better than old»: preferring newer over older treatments without considering the cost of new treatments or the effectiveness of older ones
- treating patients with terminal illness to maximize life span over quality of life, without taking into account a patient's preferences
- not recognizing Munchhausen by proxy syndrome
- diagnosing «incidentalomas» (abnormalities found in examinations performed for other reasons), and being a «VOMIT» (victim of modern imaging technology) and having «DIARRHEA» (disability is a regular rebound ofheavy and excessive apparative medicine)
- financial incentives

Quaternary prevention

The principle «primum non nocere» is a cornerstone of medicine and applies without limitation to the field of pediatrics. Especially in prevention, there is currently an explosion of new concepts of disease and health measures. More and more «diseases» and developmental disorders must be detected early by pediatricians and, if necessary, treated. New detection methods and equipments are being introduced to achieve this goal. In an area of pronounced uncertainty and anxiety with low prevalence of «disorders», the decision not to take initial or further action is often a difficult task.

Primary, secondary and tertiary prevention are well-known medical tasks. In primary prevention, there is neither illness nor disease. Strictly speaking, the patient is not a patient at all, he is and feels healthy. Preventive measures aim to stop a health disorder from arising in the first place. Examples are instructions for a healthy lifestyle and providing vaccinations.

In secondary prevention, there are diseases in the sense of assigned disease concepts, but the patient has not yet noticed them. This patient also feels well. Secondary prevention attempts to detect early stages of disease through early detection examinations. Tertiary prevention strives to prevent the complications of an existing health disorder.

Finally, quaternary prevention means the prevention of unnecessary medicine or the prevention of over-medicalization. It was first described by a family doctor, Marc Jamoulle, in 1986. The concept was recognized by the Wonca International Classification Committee in 1999 and published in the Wonca Dictionary of General/Family Practice in 2003.

Quaternary prevention is about the problem of feeling ill without having a specific disease. While the patient, or the parents, feel an illness and look for a name for it, doctors would describe a large part of these complaints as symptoms that cannot be explained medically. Many terms have been used in the history of medicine to describe this phenomenon, with psychosomatic illness as being one of them, in which psychological mechanisms can cause or enhance a disease, the consequences of which are felt physically. Somatic disease concepts for these mechanisms are highly welcomed by the patients, who thereby escape the perceived flaw of a mental illness. What all these sufferings have in common is that they open the door to further, endless diagnostic measures. Since many will have borderline or false positive results, further extensive diagnostic measures and prescriptions of unproven therapies with unknown side effects are likely. Since there is a continuum between feeling healthy and sick, while one can only have a disease or not have it, health becomes a dimensional rather than a categorical question. These patients, their parents or environment, are also called the «worried healthy» (worried well).

In pediatrics, the matter is even further complicated because the patient is usually represented by the parents. They themselves, or the patient's further environment (kindergarten teacher, teacher) believe that their «patient» has a hidden ailment, which the pediatrician is requested to discover early and to treat immediately. This is possibly a result of the efforts of the media, pharmaceutical industry, politics and medical professions striving for economic benefits by creating doubts and fears. The fact that the child (or it's caregiver) has the feeling of being ill, can influence the (preliminary) judgement of the doctor that he actually has a disorder, he only has to find it.

Overdiagnosis also has to do with the fact that the notion of what is «normal» has become increasingly narrow in recent years. Thus, more and more children become «abnormal».

Children are being labelled more and more with disease terms. Most so-called «chronic diseases», such as ADD, ADHD, dyslexia, speech development disorders, high blood pressure, diabetes, osteoporosis and so on, are diseases in which the child generally does not feel ill. The American medicine historian Prof. Charles Rosenberg formulates: «Contemporary medicine and bureaucracy have constructed disease entities that have real social effects. These disease entities arise from laboratory tests, disease-defining limits, statistically derived risk factors, and other artefacts of the seemingly value-free bio-medical companies».

Overdiagnosis is also about VOMIT, an acronym for «Victim Of Modern Imaging Technology». The shoulders of 31 perfectly healthy professional base-

ball pitchers, not injured and without pain, were examined by MRI: The MRI showed abnormal cartilage in 90% of cases and faulty rotator cuffs in 87% of cases. The American orthopedic surgeon Dr. James Andrews judges: «If you are looking for an excuse to operate on a shoulder, perform an MRI!». It is often much easier to perform some useless diagnostic «for safety reasons» than to do without it.

Since the human mind unfortunately tends to act rather than not to act or to wait and see, this can sometimes take on bizarre forms: Women in the USA continued to receive cervical smear tests in 69% of cases, even though their uterus has already been removed.

In view of these uncertainties, many patients, followed by numerous pediatricians, react with a romantic retreat into so-called alternative or complementary medicine. However, we believe that there is no alternative to good medicine that is based as much as possible on proper evidenceas well as respecting the fears and desires of patients and parents (and the environment). Evidence-based medicine (EbM), and thus the knowledge of benefits and harms of our practice by clinical trials, helps to dispose of much of the unnecessary diagnoses and therapies in accordance with our patients.

To implement quaternary prevention in our practices, we could start by reducing screening to essential components, perform fewer useless laboratory tests just for reassurance, order fewer X-rays and MRIs to prevent VOMITs, and to prescribe fewer antibiotics in cases of dubious effect, frankly omit overtreatment. It makes no sense to drown patients with potentially harmful measures «for safety reasons», for fear of patients complaining of malpractice. This also applies to measures that we take because we believe the competitor will do it anyway!

Quaternary prevention is the prevention of unnecessary medical interventions and as such a cornerstone of medicine. The best way to implement it is to listen better to our patients, to grasp their hidden agenda. One tries to adapt the medically possible to the individual, but also to the socially needed and desired[12]. We need a strong and sustainable relationship with our patients and their trust in our sincerity. The other important means is evidence-based medicine: the knowledge of realistic predictive values of diagnostic tests and expected effect sizes of benefit and harm of therapy and early detection measures. Quaternary prevention is therefore an intrinsic task of good pediatrics!

Further implications

There are not only unnecessary health care and missing quaternary prevention bothering the field of pediatrics. There is also a need of adapting our daily duties to the problems of society as a whole. In 1986, the World Health Organization (WHO) agreed to the Ottawa-Charta for health promotion[13] to define a new health care guideline: from prevention of diseases to more health promotion. The quality of individual health is tied closely to factors such as peace, reasonable quality of housing, education, income, stable ecosystems, social security, and equal opportunities. Therefore, the responsibility of healthcare providers is not restricted to their office or hospital, but applies to the whole society. The Ottawa-Charta[13] describes three main strategies:

1. advocate health promotion in all fields
2. enable the patients that they too can influence the society as a whole
3. mediate health promotion.

Looking at the load our society puts on the children today and in the future, like environmental hazards, toxic substances in drinking water, rising poverty[14] especially of single mothers and their children, inequality of pay and pensions, unequal chances for education, privatization of medical services and the development of two-tier healthcare and last but not least climate change, opens a wide field for taking action. The children of tomorrow will be happy to find their pediatrician as supporter on their side, defending their interests. The field of pediatrics will be wider, ever more difficult and complex, thus it needs highly committed doctors more than ever. The children will be thankful.

Thanks

Continuous debates with Stephan Essig, MD, University of Lucerne for the opportunity to hold lectures in the field and Sabine Müller, MD for corrections, important hints and optimizing my english!

Recommended readings

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Notes

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The content of this article reflects the opinion of the author and does not necessarily reflect the opinion of the editors or the Swiss Society of Paediatrics.

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