THE LANDSCAPE FOR PEOPLE WITH 22Q11 SYNDROME IN THE UNITED KINGDOM

A REPORT COMPILED BY THE 22Q11 SYNDROME ALL-PARTY PARLIAMENTARY GROUP

THIS REPORT WAS RESEARCHED AND FUNDED BY MAX APPEAL

OCTOBER 24TH 2016

MAX APPEAL ACTS AS THE SECRETARIAT TO THE 22Q11 SYNDROME APPG.

info@maxappeal.org.uk | www.maxappeal.org.uk
+44 (0)1384 821227 MaxAppealUK

MAX APPEAL, 15 MERIDEN AVENUE, STOURBRIDGE, WEST MIDLANDS, DY8 4QN

24th October 2016

REPORT CONTENTS...

STAKEHOLDER GROUPS

OUR VISION

Max Appeal's vision is of a society where children and adults affected by 22q11.2 deletion are valued and able to fulfil their potential.

OUR MISSION

To enable people with 22q deletion to lead an independent and economically prosperous life as possible with Max Appeal being the voice to achieve appropriate medical care, social support employment and empowerment for individuals and their families.

MAX APPEAL
SUPPORTING FAMILIES AFFECTED BY 22q CONDITIONS

22q11 Northern Ireland

the 22 crew

The objectives of The 22Crew are to relieve the needs of people living with 22q11.2 Deletion Syndrome ("22qDS"), their families and carers in particular but not exclusively by the provision of support, advice and assistance and to advance the education of the public in the condition known as 22q Deletion Syndrome.

1 Key Findings

22q11 syndrome is a common disability hiding in plain sight.

1. 22q11 syndrome is massively undiagnosed. 128,000 people in the UK are estimated to be affected but only 2,187 diagnoses have been confirmed.
2. A prevalence of 1 in 500 of the population is reported. This is twice that of Down syndrome and almost six times that of cystic fibrosis.
3. The extreme lack of awareness of 22q11 syndrome means there is an extreme lack of specialised services. There are only five specialist Multi Disciplinary Team clinics for people with 22q11 in the UK.
4. Mental health difficulties affect as many as 93% of people with 22q11 Syndrome, such as depression and anxiety disorders. It is also the single most common cause of schizophrenia which affects 25% of people with 22q11 syndrome.
5. 22q11 syndrome is a complex and varied condition. People known to have 22q11 are seen by a huge range of specialists. This "hidden cost of illness" is a significant issue for the NHS, social services and welfare state.
6. Transitional care is pivotal in how children adapt to adulthood. The specialist transition clinic in Belfast provides a model of planned transition that could be adapted across the UK.
7. Apprenticeships offer good opportunities for people with 22q11 syndrome, for whom unemployment rates are disproportionately high compared to academic achievement. However only 8.8% of apprentices started in 2014/15 had a declared disability, which is much lower than other minority groups.

We conclude that the findings contained in this report paint a difficult picture for people with 22q11 syndrome and their families, including far reaching implications ranging from social care needs, inclusion in society, a wide selection of healthcare needs and often failed education and employment skills opportunities.

2 About 22q11.2 Syndrome

22q11.2 is like a post code that tells medics that 40 or so genes are missing or duplicated from the long arm of the 22nd chromosome. Confusingly 22q11 has been known by other names, such as Di George syndrome, velocardiofacial syndrome (VCFS) and Shprintzen syndrome. In order to avoid further confusion for people with 22q11, their families and professionals, the first international guidelines for people with 22q (published in 2011) recommended use of the term 22q11.2 deletion syndrome (or 22q11.2 DS). The effect of 22q11.2 Deletion Syndrome (and Duplication Syndrome) is unique to every individual, from fatal heart defects, catastrophic immune deficiency and severe learning difficulties to mild behavioural problems, speech and language issues and facial characteristics. It is a multi – system disorder and the greatest genetic risk factor for schizophrenia.

22q11 Syndrome All-Party Parliamentary Group (APPG)

Max Appeal, acting as secretariat for the 22q11 syndrome APPG, came together with other stakeholders 22q11 Northern Ireland and The 22 Crew, MP's and medical advisors to form the APPG in December 2014 to raise awareness with the highest level decision makers.

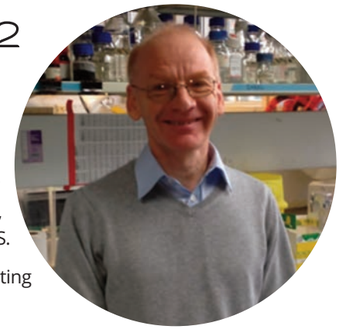
3 Introduction

At the 22q11 syndrome APPG meeting on the 23rd June, 2015 Julie Wootton the Chair of Trustees of Max Appeal gave a brief outline of the issues being faced by people who have the condition, or child or family member who have 22q11 syndrome. It was agreed that the condition affected all aspects of family life and was something that should be brought to the attention of MPs so they could better serve the needs of their constituents.

It was agreed that the long term objective was to bring a substantive report to the house concerning the effects of the condition and the ramifications that it had for health, education and social care providers in terms of known costs and efficiencies of having co-ordinated care and support. The tests to diagnose the condition, perceptions of those with the condition to society, and the estimated prevalence of the condition were also discussed.

Leading professionals with an expert knowledge of 22q11 syndrome attended the APPG over recent months and highlighted areas of concern.

4 The Frequency of the 22q11.2 Deletion and Duplication and its Implications



Professor Peter Scambler, is a professor of Molecular Medicine at University College London, Institute of Child Health and is Chair of the 22q Society, which is the International Society for clinicians, academics and researchers with an interest or expertise in 22q11 DS.

The following information was submitted to the APPG at the meeting in December 2015, and represent his opinions.

Chromosome 22q11.2 deletions and duplications are examples of copy number variations. Apart from most genes on the X chromosome of males, genes are represented twice in the genome. In deletions copy number is reduced to one (except in extremely rare cases where both copies are missing), and in duplications copy number is increased, almost always to three. For some genes correct dosage is very important, and too much or too little can lead to abnormal development of the fetus or post-natal disease. The 22q11.2 deletion syndrome can result in a large range of birth defects with varying severity most notably heart abnormalities as well disorders of feeding, immunity, speech, learning, behaviour, and psychiatric problems. Most cases occur "out of the blue"; 5-10% are inherited.

Historically, estimates of the incidence of 22q11.2 deletions have been constructed from regional clinics that tended to deal with the major presenting problems, congenital heart defect or palatal abnormality for example. Extrapolating from these studies yielded estimates that 1 in 4000 live births would be affected with the condition, but these studies were limited by their small size and restricted purview and by definition would miss cases without major abnormality.

A recent multi-centre, international study shed light on these issues (lead author: Francesca Grati)[1]. The aim of the study was to examine copy number variation across a number of chromosomes (not all) including number 22. The study examined more than 9600 pregnant mothers that came into clinic over a 3.5 year period, with 12 centres taking part. Each patient had undergone a biopsy procedure called chorionic villous sampling or amniocentesis, in other words a sampling that allows one to look at the DNA of the unborn fetus. The study then divided these pregnancies into what they called high risk and low risk categories, where risk refers to the chance that, in the authors' opinion, the unborn baby would have a chromosome abnormality. **Therefore, when interpreting this study it is vital to consider the validity of their high vs. low risk assignments.** The high risk group was not controversial and here ~1% of unborn babies had the 22q11.2 deletion and ~0.3% the duplication. In the low risk category, which in theory should be close to population risk (see overleaf), the deletion was present in ~0.1% and duplication detected at a similar rate.

How likely is it that the study reflects the UK experience?

While no UK lab. was involved, most laboratories are from Europe and there is no evidence to suggest the deletion frequency differs between ethnic or national groups. Thus UK figures are likely to be similar.

How does early diagnosis help?

A big question to which the answer depends on the individual patient. For a severely affected baby, for instance with a congenital heart defect, the surgical team can be on hand at birth if necessary, and they will know the various factors to take into account when treating a heart defect in the context of a patient with other 22q11.2-related complications. In the less (immediately) severely affected child, the diagnosis will allow interventions that promote effective feeding, speech development, and schooling for example. Not least, the diagnosis will prevent what has been termed the "diagnostic odyssey", where the child and family are bounced from clinic to clinic in search of a diagnosis. This is not a reflection on the clinicians, it's more that the syndrome is so extra-ordinarily varied and can present in so many ways.

The rationale for assignment to low risk was reasonable. However, it is possible to take a more stringent approach by being more selective in considering just the two groups for which there is reason to believe they represent the lowest risk of all. One group of mothers was referred for "anxiety" and had no other reason for the test other than an attempt to address the mother's concern. A second group were referred for advanced maternal age. This is a group of women is known to be at risk for trisomy 21 (Down syndrome), but these pregnancies were unaffected from this point of view. A great number of studies of 22q11.2 deletion syndrome have been published worldwide and there is no evidence that maternal age is a risk factor for deletion in their children. Of course, by reducing the numbers of cases analysed in this way statistical power is lost, but 2 deletions were found in this set of 2438 cases, 0.08%. This gives us considerable confidence that the 22q11.2 deletion frequency is much greater than previously recognized. The reason is very likely to be that (by definition) no clinical problem was required to be present prior to the test being conducted. We can only speculate about the post-natal issues that will arise in these children of low-risk pregnancies that carry a deletion, but suffice to say 22q11.2 deletion syndrome presents many issues at different stages of life.

Why was the duplication 22q11.2 more frequent in the low risk group than the high risk group?

Generally speaking the clinical problems associated with duplication 22q11.2 are much less severe than deletions. Therefore, fetuses with the duplication are less likely to have the kind of serious abnormalities detected on ultrasound examination that led to the high risk classification in the first place. Remarkably, though, patients with a duplication can appear similar to those with a deletion, e.g. they may have heart defects, mild learning difficulty and changes to facial appearance. In fact, 22q11.2 duplications were first detected in the laboratory in patient samples sent in by clinicians expecting to find a deletion!

Can such tests already be done outside the NHS?

Screening tests on maternal blood samples for fetal chromosome abnormalities including trisomy 21 and 22q11.2 deletions are already available in the private sector (e.g. through Natera www.natera.com).

Summing the deletions and duplications of 22q11.2 found in the paper's original low risk group we have 13/5953 abnormalities, or approximately 1 in every 460 pregnancies. This is a higher incidence figure than that of trisomy 21 (Down syndrome) (1/700), for which there is a UK-wide screening program (involving ultrasound and a serum sample, not a genetic test). It is worth emphasising that we know little about the long-term consequences of 22q11.2 duplication, as published reports have almost certainly been describing the more severely affected end of the clinical spectrum. While not in itself of any statistical significance towards the refinement of an incidence figure, it is somewhat remarkable that a case has been reported with a deletion on one chromosome 22q11.2 accompanied by a duplication on the other [2].

Conclusion

The frequency of 22q11.2 deletion coupled with its serious and varied clinical consequences makes a good case for including the condition in future antenatal screening programs. Moreover, it is becoming apparent that 22q11.2 duplications are just as common. While we know much less about the implications for any individual carrying a duplication it is certain that some will have clinical or educational problems. The genetic screening envisaged for 22q11.2 deletion would by its nature detect the duplication.The progress in developing a "non-invasive" test (taking a blood sample from the mother to analyse the DNA of the unborn child)removes the risk to the fetus that accompanies amniocentesis and chorionic villus sampling.

5 Testing for 22q11 Syndrome now and moving forward

Max Appeal's own findings

After contacting all 23 regional genetics units in the United Kingdom, 16 supplied results and they are shown below. All units were asked to provide diagnoses split between pre and post 2010 and deletions and duplications. The year 2010 was picked because this is around the time when genetics units began switching to a full array test, which means that all deletions and duplications would be identified. Earlier testing was carried out by FISH, which is a specific test for 22q11.2 deletion and had to be specifically requested and the usual full karyotype examination employed then does not reveal the deletion or duplication as it is too small to be seen under a microscope.

There were many issues with some of the units extracting the required information from their systems and some were not able to provide splits between deletions and duplication or pre and post 2010. Subsequently the information is incomplete and has taken a considerable length of time to acquire.

What the table does show, however, is that as expected the number of diagnoses has increased significantly in most of the units since 2010 particularly bearing in mind that the FISH test was available since the late 1990's and we are only in 2016 now, ie we are comparing over 20 years data with FISH to 6 years data with full array testing.

The total number of reported diagnoses (even if factoring for the 7 units that have not responded so far) bears out the statements regarding the condition being severely undiagnosed. Again this was expected but is still very disappointing just how low the numbers currently reported diagnosed against the estimated prevalence.

22q11 syndrome is massively undiagnosed. 128,000 people in the UK are estimated to be affected but only 2,187 diagnoses have been confirmed.

Regional Genetics Centre		Deletions	Duplications		
Belfast					
Pre 2010					
Post 2010					
	Sub Total	**111**		**Total**	**111**
Birmingham					
Pre 2010		175			
Post 2010		170			
	Sub Total	**345**		**Total**	**345**
Bristol					
Pre 2010		226			
Post 2010		116			
	Sub Total	**342**		**Total**	**342**
Cambridge					
Pre 2010		73			
Post 2010		26			
	Sub Total	**99**		**Total**	**99**
Cardiff					
Pre 2010		23	0		
Post 2010		32	3		
	Sub Total	**55**	**3**	**Total**	**58**
Dundee					
Pre 2010		10	2		
Post 2010		1	5		
	Sub Total	**11**	**7**	**Total**	**18**
Edinburgh					
Pre 2010		41	5		
Post 2010		82	35		
	Sub Total	**123**	**40**	**Total**	**163**
Liverpool					
Pre 2010		20	1		
Post 2010		37	24		
	Sub Total	**57**	**25**	**Total**	**82**
London					
Pre 2010		12			
Post 2010		2			
	Sub Total	**12**		**Total**	**12**
Manchester					
Pre 2010		88	5		
Post 2010		79	59		
	Sub Total	**167**	**65**	**Total**	**232**
Nottingham					
Pre 2010		19	7		
Post 2010		34	36		
	Sub Total	**53**	**43**	**Total**	**96**
Oxford					
Pre 2010		96	19		
Post 2010		50	40		
	Sub Total	146	59	**Total**	**205**
Sheffield					
Pre 2010		35	5		
Post 2010		25	10		
	Sub Total	60	15	**Total**	**75**
Southampton					
Pre 2010		183			
Post 2010		166			
	Sub Total	349		**Total**	**349**
Total Number of Diagnoses Reported:					**2,187**

6 Mental Health

Dr Clodagh Murphy is a consultant neurodevelopmental psychiatrist at the Behavioural Genetics Clinic, Adult Autism and attention deficit hyperactivity disorder (ADHD) services, the Maudsley hospital and honorary consultant child and adolescent psychiatrist at the 22q clinic, Great Ormond Street Hospital, London. She is also a member of the International 22q11.2DS Brain and Behaviour Consortium.

The following information was discussed at APPG meetings

People with 22q11 (previously known as velocardiofacial syndrome (VCFS), DiGeorge syndrome or Shprintzen syndrome) are vulnerable to a range of physical and mental health difficulties. In addition to physical difficulties, including heart, palate and immune function, people with 22q11 have a significantly increased risk (30–50%) of developing neurodevelopmental disorders and mental health problems including; autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), learning difficulties, low mood, anxiety, obsessive compulsive disorder (OCD), learning difficulties and early-onset psychosis. Despite this, the mental health of children and adults with 22q11 is often overlooked and people with 22q11 and their families report real difficulties in accessing mental health care in the UK.

Overall, findings have shown that people with 22q have a very high risk of mental health problems. Approximately 30 – 50% of both children and adults with 22q have mental health problems However, people with 22q and their families have real difficulty in having their mental health problems recognized and accessing mental health services. Unidentified mental health problems and absence of treatment come at a significant cost to the individual with 22q, their families and society.

The unmanaged mental health problems of people with 22q11 can incur a significant cost to the individual, their families and society. These costs may include lost education, employment, accommodation and the long-term personal and clinical costs of unmanaged mental health problems. The mental health problems that some people with 22q11 have are the same problems that people who don't have 22q11 have, and can occur across the lifespan from childhood to old age. For example, in primary school years, ADHD or ASD; anxiety, low mood or OCD in teenage years; or psychosis in adulthood. For example, approximately 1-4% of the general adult population will have an episode of psychosis and 5% will have anxiety. In contrast, much higher rates of psychosis (25%) and anxiety (12 -57%) are reported in people with 22q11. Autism spectrum disorders occur in 1:100 people in the UK; yet rates of ASD are reported in 30-50% children with 22q11. Similarly, ADHD occurs in 3-5% of the population; but ADHD is reported in 30 – 50% of people with 22q11. If these common mental health problems were correctly identified, they could then be managed. However, many people with 22q11 and their families report that health teams overlook their mental health concerns or see them as being "just part of 22q", rather than as treatable problems.

Overall, the relative risk of somebody with 22q11 developing schizophrenia is about 20 to 25 times the lifetime general population risk of 1%. That is, approximately one in every four to five adults with 22q11.2DS will develop psychosis. As such, 22q11 represents the highest known genetic risk for developing schizophrenia. Yet, despite this, there is an absence of mental health services for people with 22q11 in the UK. These figures are replicated across a number of international clinical research studies. However, as they included people who attended the clinical studies, rather than those who were unable to do so, it has been suggested that rates of 22q, and associated mental health problems, are under-reported.

Further, there is preliminary evidence that some people with 22q may also be more vulnerable to having mental health problems at an earlier age than people who don't have 22q11, including early onset psychosis (psychosis before 18 years of age) and early onset Parkinson's disease (before 50 years of age).

As children get older, if they don't get help or treatment with these problems, the problems can become more acute, affecting family, education, confidence levels, health, wellbeing and employment

There is increasing recognition of the need for young people with neurodevelopmental disorders to have a planned transition from child to adult health services. However, lack of services, differential funding of child and adult services, and differing regional eligibility criteria for care may contribute to mismatched resources. As such, those young people with 22q who are known to child services and are transitioning to adulthood may become lost to health care at a crucial time of increased vulnerability. Furthermore, there is a lack of awareness about 22q amongst professionals, including teachers, GPs, hospital doctors, psychologists and speech therapists. Perhaps not surprisingly, many people with 22q, their families and professionals feel confused about how to navigate their way through the quagmire between child and adult services. Overall, there is a lack of planned transitions for young people with 22q moving from young people's to adult health and education services. As such, many young adults fall through the gap in health care and education at a particularly vulnerable time in their development.

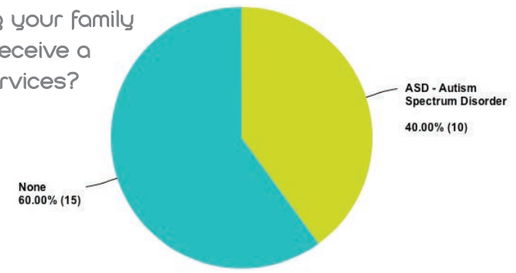
Many people with 22q can have learning difficulties, including mixed cognitive profiles so they may find they are much better at some things than others, borderline learning difficulties or specific learning difficulties, such as maths. Learning difficulties may adversely impact on their everyday lives and daily living skills, such as managing money or telling the time. These areas have all been identified as problematic by people with 22q and their families in a recent survey, noting difficulties across home, education and employment.

Max Appeal has commissioned a questionnaire about the experiences of people with 22q (aged from 4 to 25 years) and their families in accessing mental services across the UK, Some of their key concerns were;

- waiting times: 45% of families have waited more than 12 months to see a specialist.
- mental health and awareness of 22q: despite high rates of significant mental health problems in people with 22q, 60% of people with 22q seeing local services did not receive a psychiatric diagnosis and were assessed by clinicians who may not have heard of 22q11 syndrome or are not familiar with international guidelines regarding best management of health problems for people with 22q
- lack of support: 44% have received no support or assistance managing on a long term basis
- quality of available support: 67% described what support was available was poor. Furthermore, they felt that this impacted widely on their families.

Overall, there is a lack of mental health care for children and adults with 22q11 in the UK, including identification and treatment of associated health difficulties like ADHD, anxiety, or psychosis, planned transition from child to adult health care, aging across the lifespan, awareness of 22q, and consideration of the views of people with 22q11 and their families in health services development.

If you had any concerns regarding your family member's mental health, did they receive a psychiatric diagnosis from local services?



- 44% have received no support or assistance managing on a long term basis
- When asked how successful was the support in managing the behaviours relating to 22q11 syndrome, 67% reported poor results which impacted widely on their families.

7 Families' experiences

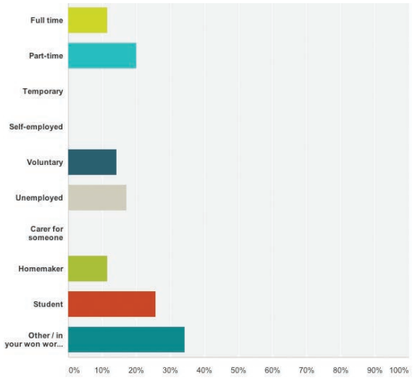
Max Appeal conducted a survey across its membership. One survey in particular looked at the experiences of adults affected by 22q11 syndrome. The age range was from 18 years upwards.

It was found that the majority of those affected by 22q11 syndrome were disadvantaged in many aspects of their lives.

47% of those affected by 22q11 syndrome had attained no formal qualifications and only 8% had a higher education, professional or vocational equivalent qualification.

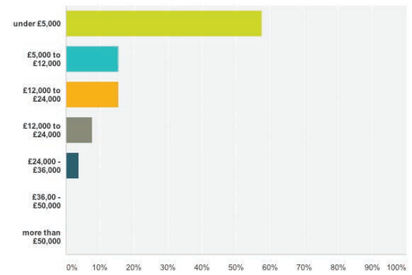
Most adults have borderline intelligence 70-84; 30% have mild intellectual disability (IQ 55-69). Particularly weak arithmetic ability renders many financially vulnerable.

Please tell us about any work you do currently (please tick all that apply).



Only 31% of those questioned were in either full time or part time employment. The majority 60% reported their earnings were under £5,000 with less than 4 % able to achieve the national average wage for 2016/ 17 of £27,000.

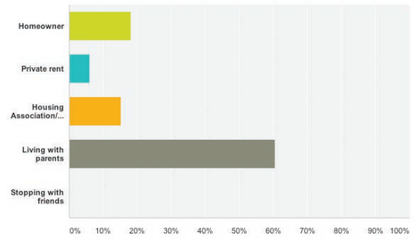
Please tell us your annual income from wages/salary.



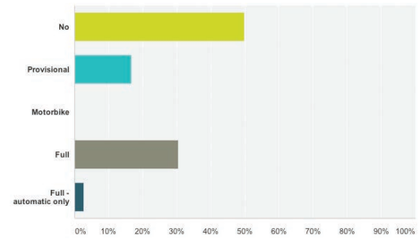
Most people reported they were in receipt of some form of state benefit; 59% were in receipt of Disability Living Allowance or Personal Independence Payment and 34% were receiving Employment and Support Allowance. Many people affected by 22q11 syndrome were not independent as adults and they were heavily reliant on their families for support and housing. 61% of those surveyed were living with parents and 15% were in Housing Association or Council accommodation.

"We have had no support in managing Mat's behaviour. Been very desperate at times but "funding has been cut" for what we need. One phone call giving us "tantrum" management was about it. Mat's team have never got back to us, CAHMS have no psychologists."

Let us know a little about your housing situation. Are you...



Do you hold a driving licence?



The above findings paint a difficult picture for those affected by 22q11 syndrome and the far reaching implications ranging from social care needs and inclusion in society, a wide selection of healthcare needs, failed education and employment skills opportunities.

Dr Alex Habel, Medical Advisor for the 22q11 syndrome APPG agrees that many fall through the cracks because the funding is a problem across all the services then the priority is just being seen, the issue is once you are seen, there are no resources in place to meet the needs required. Early intervention and awareness will be invaluable.

There is a lack of 22q11 syndrome knowledge at the early stage of doctor's training.

22q11 syndrome is something that needs to be taught at an early stage, through university curriculum and medical training.

The RCP International Conference workshop 'New advances in research on copy number variants relevant to psychiatry', was well attended for a specialist session, with some 50 participants. The Chair was Prof David Linden, with two speakers from the Cardiff MRC unit led by Prof van den Bree were Dr Sam Chawner, on CNV's and the relationship to disease processes and Dr Andrew Cuthbert on the assessment of behavioural and cognitive differences in CNV's, and myself on the clinical presentation and management of 22q11DS. Presenters expressed their appreciation of the co-operative relationship with Max Appeal, which was gratifying and appropriate.

Sirmione was a very stimulating meeting, with UK parents asking pertinent questions to the presenters of the papers.

Highlights for me emerging from research not yet approved or at an experimental stage:

1. The potential of antenatal cell free DNA testing has received attention in the media, and interesting results were reported in the Conference in support of antenatal screening for 22q11DS. The ethical difficulties of counselling and managing pregnancies with a positive test were briefly referred to.
2. One researcher reported a tiny piece of DNA lined up back to front in the deletion region of the 22q11 chromosome might predispose to the deletion, but its early days.
3. Professor Baldini showed experimental work identified vitamin B12 as a possible treatment in specially created mice with a reduced amount of chromosome DNA Tbx1 at 22q11. Giving the embryo the vitamin helped some of them to increase the number of cells they need to develop.

Also a lot more papers on the young adult and adults, not before time!

8 Apprenticeships and 22q11 Syndrome

Martin Kennedy (Max Appeal trustee) writes:

Over the past three years I have worked very closely with Apprentices and Apprenticeships through my employer and in my own time. My commitment to this work was recognised in October last year when I was awarded the Yorkshire and Humberside Apprentice Champion of the year award.

A lot of my work involves me engaging with Employers, Colleges and schools presenting to students and staff alike about the benefits of Apprenticeships and how they are a genuine pathway to develop skills, have a career and increase productivity. It was only when my 22q daughter Chloe came to school leaving age last year that I realised the gap that existed in such opportunities for people like her. I am an Apprentice Ambassador for the National Apprenticeship Service and through my contacts I have asked about what opportunities there would be for People such as Chloe through the Apprenticeship route and unfortunately this seemed very difficult due to the levels of attainment required to be achieved academically during the Apprenticeship.

This was disappointing and I felt it left a huge gap condemning people like Chloe to a life of unemployment when I know with the right support she would be capable of contributing to society. She has now enrolled at a local college.

At a time when the country is re-engaging with the Apprenticeship route I feel there is a gap / wasted opportunity there currently whereby people of a lower level of ability do not get the opportunity to engage with a structured form of employment that would develop them to be able to engage with society at a level which currently isn't open to them.

It is positive on lots of different levels, not just from the psychological well being of such groups from an esteem and integration perspective, but also from an economic perspective too ..... when people are employed they aren't drawing benefits.

"We had spent years hitting brick walls trying to get support for Hannah – we were at the point where we were literally begging for help. One day in August Hannah decided she could no longer cope - she began to see black bits, couldn't swallow which led to voices telling her to jump off our kitchen roof trying to end her life."

SUPPORTING FAMILIES

Martin presented this information to the APPG in May 2016:

The Government's plan to increase the amount of Apprenticeship starts in England to 3 million by 2020 is well documented. Apprenticeships work for people of all ages and backgrounds, and can transform lives as people contribute to the economy as their skills develop. They create the opportunity for young people, of all abilities, to reach their potential giving them what it takes to achieve a successful career and secure an income in the years ahead.

In the up and coming Apprenticeship reforms the new Apprentice levy will be funding Apprenticeships and in real terms will be doubling the annual spend on Apprenticeships to £2.5 bn. A mere 8.8% of people starting Apprenticeships in 2014/15 had a declared disability or learning disability and this figure is disproportionately low as compared to other minority groups.

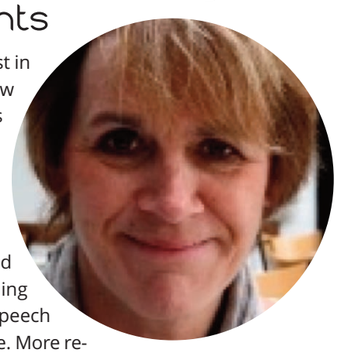
Many of the 22q group Max Appeal represented by Max Appeal charity have mild learning disabilities and are very capable of contributing positively to the economy in lower level work-based learning type Apprenticeships. A particular feature of the condition is their ability to focus on detail in a task focussed type of environment making them ideal candidates for repetitive type roles.

It is the gift of the employer to employ members of the LDD (Learning Difficulty or Disability) group and with just 6.8% of the group in employment this places a huge burden on the economy in benefit payments. This is a missed opportunity and with a little bit of agility and forward thinking on the part of the employer this huge negative could be turned into a positive and the benefits of employment to the individual are immeasurable from a self-esteem perspective as they are no longer fully dependant on the welfare state, earn their money and are contributing to the economy.

Conclusion

Apprenticeships are a real option for people with the 22q (and other such groups) condition offering them an option to develop lifelong skills and increase their potential to gain employment. With finances becoming available through the new Apprentice Levy the question has to be asked how much of these funds can be used to support /encourage employers to employ people within the LDD group as Apprentices so they can contribute positively to the economy, and society as a whole, by fulfilling that very basic need – being able to work!

9 Great Ormond Street Hospital study on patients and families experience accessing healthcare for 22q11 DS patients



Dr Debbie Sell OBE is a Principal Speech and Language Therapist in the North Thames Regional Cleft Service and Senior Research Fellow in the Centre for Outcomes and Experience Research in Children's Health, Illness and Disability (ORCHID), both based at Great Ormond Street Hospital. Previously in managerial and lead roles, Debbie is now focusing on research and clinical practice, together with teaching, mentoring and supervising colleagues.

Her areas of special interest include speech disorders associated with cleft lip and palate and their management, nasal sounding speech in general, perceptual and instrumental assessment, speech prosthetics and 22Q11 syndrome / Velo Facial Cardiac Syndrome. More recently her research has expanded to include qualitative strands of research activity.

Dr Debbie Sell OBE has delivered some preliminary findings from her study;

Understanding developmental, behavioural and mental health needs in children and young people and their families with 22q-11 deletion syndrome: informing nurse/AHP (Allied Health Professions) led interventions funded by the Burdett Nursing Trust. In preparation.

Dr Debbie Sell, together with Drs Abrines-Jaume, Jo Wray, Kate Oulton, Clodagh Murphy and Mrs Julie Wootton have conducted a study on children and young people (CYP) over the age of eleven years affected by 22q11 syndrome, and their families. They have investigated the developmental, emotional and mental health needs and experiences of these individuals, barriers to accessing support, and understanding what would be helpful. They used mixed methods to collect data from the different stakeholder groups (parents, CYP and professionals from the five UK multidisciplinary teams), including focus groups, one to one interviews, an online forum hosted by Max Appeal and a workshop which took place in March 2016.

Preliminary results are described as follows.

The overriding themes expressed by parents/carers were:

- There is a lot of help in the preschool years particularly around physical needs to the neglect of developmental needs.
- Help for cognitive, behavioural and emotional difficulties disappears at later stages of development, particularly in the late junior school years and is often non-existent once at secondary school.
- Serious lack of awareness and knowledge of 22q11 syndrome by healthcare and educational professionals.
- Parent becomes the "expert parent" often left having to "fight the system".
- Uncertainty of what to expect, when and how to access help and support, due to the wide variation and unpredictability of symptoms over the years from birth to adulthood.

Parents/Carers identified difficulties in accessing cognitive assessments and even more difficulty having these undertaken and interpreted by professionals with experience of the learning profile found in 22q11 syndrome. CYP with this condition do not fit easily into established categories, and often are not considered different enough or meet the threshold to warrant support provided by Education and Healthcare Plans. However, as the school curriculum becomes more abstract in the junior school years, and mental health and behavioural difficulties become increasingly apparent, their needs are high. The CYP themselves confirmed this through their interviews. They described their awareness of their difficulties with learning and needing help, being different to their peers, their lack of self-confidence in interacting with others and feelings of isolation. They are often viewed as quiet and passive in the classroom, in contrast to at home where parents reported acting out and misbehaviour. CYP reported feelings of low mood, anxiety, frustration and anger. The emotional impact on CYP is underestimated, as they struggle to understand what is wrong with them. Accessing intervention for mental health issues is very unusual for these families due to a dearth of psychological services providing intervention, and the assumption that this is part of the condition and somehow 'not treatable'.

Parents recommended that there is much greater awareness of the condition, beginning with the adoption of one name only. Parents described how they need access to a multidisciplinary core team, including paediatrician, psychologist, psychiatrist, speech and language therapist, who are experts in this condition. There are only 5 such teams currently in the country not all of whom have all the mental health specialties. These have not been set up on a funded basis, but out of the enthusiasm and care of professionals. As a result, accessing psychological help and even assessment from these teams is extremely difficult. The following quotes are from parents regarding the importance of this type of clinic:

> *"Well, recently I tried to get X referred to a 22q deletion clinic, and I was told that, 'We're not running.' It was only for new diagnosis, but he was just suffering so much with the hormones and he was becoming more aggressive, and I needed help with that. I needed help with his voice because it was becoming more hoarse. I can't understand him as well as I used to before .And aggressiveness. Obsessiveness. I need that 22q deletion clinic to be running, because we don't have any support. We don't have any support from the GP".*
>
> *"It is, you know, very common, and of course that makes it harder, because if you have a very rare condition now, it's likely that you're going to get a very rare condition type clinic in one place or two places in the UK, but because it's so common, that's the irony, that those services are not there..."*
>
> *"Knowledge of 22q11 syndrome in community health and education is very limited and there are currently few specialist clinics".*
>
> *"Sometimes when visiting professionals, I am not confident they will have much experience of dealing with 22q11 syndrome cases. I feel much more confident on the advice given when I am seeing someone from one of the specialist clinics on 22q11 DS. This also leads me to wonder how efficient the NHS is in dealing with those affected by 22q11 syndrome and if we are receiving best advice".*

Parents describe how these expert teams need to be diagnostic, preventative, and to serve as an expert resource, working in partnership with their local team, which should ideally be led by a community paediatrician with a special interest in 22q11 syndrome. As in other areas of disease, there is a strong need for a clinical nurse specialist to serve on this team to help facilitate the complex journey of the CYP and their family from infancy, through their growing years and transition to adult health services.

10 Accessing Healthcare for 22q11 Syndrome across the UK

The complexity of 22q11 syndrome makes it challenging to manage especially where no coordinated approach to health services exist and few multi- disciplinary clinics exist.

59% of families surveyed do not attend a specialist clinic for 22q11 syndrome.

There are a limited number of specialist clinics across the Uk for 22q11 syndrome.

The main centres are; Great Ormond Street Children's Hospital, Addenbrookes Cambridge, South West Cleft Team, Heath Hospital Cardiff, Newcastle and Belfast. There is one adult clinic at the Maudsley Hospital South London.

The range of specialists seen by those affected by 22q11 syndrome is wide ranging. They include; paediatricians, occupational health, physiotherapy, dietitians, podiatry, specialist nurses, speech & language therapy, craniofacial & palate surgeons, specialist dentistry, ENT, audiologists, cardiologists and cardiac surgeons, immunologists, endocrinologist, clinical psychologists, psychiatrists, orthopaedic surgeons, pulmonology specialists, opticians, geneticists, diabetic specialists.

A recent study by Genetic Alliance Uk on 'Hidden Costs of Rare Diseases' highlighted the problems of costing delivery of services by the NHS for complex diseases. Many of these issues will apply to services for patients affected by 22q11 syndrome. The study highlights the difficulty of assessing cost and benefits of care as no models of care for rare diseases exist and further research is required to understand the costs.

Not only does managing care in an un coordinated way add costs for the NHS it is also extremely challenging for the patient and their families. The cost of getting to and attending appointments, taking time away from work and generally managing care can also add a financial and psychological burden on the family. Some members of the family may also be affected by disability as 22q11 syndrome can be inherited from one of the parents.

Families often welcome the approach of a multi–disciplinary clinic and they feel more secure as they are often seen by clinicians who are familiar with 22q11 syndrome. In general, the multi- disciplinary clinics offer an improved patient experience as in many medical clinics the awareness and knowledge of 22q11 syndrome is generally low.

In Newcastle upon Tyne patients are seen in a 'Virtual clinic'.

The key clinicians and allied healthcare professionals meet 3-4 times a year to highlight specific areas, problems, and signpost new patients waiting to see specific aspects of the service.

At each clinic visit, the physicians make sure that patients are seeing or have been referred to other relevant specialists, and all specialists are copied into correspondence.

The virtual clinic is not specifically funded, but relies on the current structure and funding streams.

11 Transition Clinic for 22q11 Syndrome in Northern Ireland

In January 2015 22q11 Northern Ireland made a proposal to the Northern Ireland Health Minister outlining the need for a 22q11 syndrome specialist clinic.

Through this proposal a 22q11 Syndrome Transition Clinic was born. The aim of the clinic was to provide patients with a diagnosis of 22q11 syndrome with a holistic care plan which would centre around the mental health aspect of this condition, whilst at the same time ensuring all aspects of the condition were managed.

Geneticist, Dr Tabib Dabir, Psychiatrist Dr Janet McPherson and Patient Advocate Coordinator, Gillian Cassidy see a pre-selected number of patients each month at a specifically designated clinic based in the Belfast City Hospital. Dr Tabib ensures all medical aspects of the condition are evaluated and uses the Max Appeal Consensus Document as a guideline to ensure all blood-work and relevant testing is up to date. If a patient brings any new medical issues Dr Tabib ensures forwarding referrals are made then follows up with the patients at the next clinic appointment. Access to an open database of all medical records is used in Northern Ireland and makes this process significantly streamlined. Dr McPherson is there to evaluate, asses and follow up with patients who require access for their mental health. Gillian's role within the clinic is to welcome patients, explain the clinic and the staff, prepare and issue welcome packs which include, among other things, a copy of the Max Appeal Consensus Document and information on local, national and international 22q11 peer support groups and charities. Gillian also provides follow up with patients on requested information which relates to education, benefits, patient trials, social networking, and family networking.

The clinic has initially been aimed at young adults around the age of transition from paediatric care into adult care. The mental health aspect of this condition had no care plan in place and this is the primary focus of the clinic. There are circa 150 diagnosed cases of 22q11 in Northern Ireland and it is the clinics plan that all of those with a diagnosis will be seen yearly. The mental health aspect affects those with 22q11 from childhood right through to the elderly so the role and remit of the clinic is likely to expand.

The Patient Advocate Coordinator role is, as yet, a non funded, voluntary role and applications to ensure its sustainability are vital. Patient family feedback from the clinic include "it's about time", "no-one seemed to care about us", and "can we please be seen again".

A synergy of parliamentary, health trust and patient advocate collaboration has paved the way for this clinic to both provide a remarkable effective care plan which is also long term cost effective.

12 References

Prof Scambler's references

[1] Grati FR, Molina Gomes D, Ferreira JC, Dupont C, Alesi V, Gouas L, Horelli-Kuitunen N, Choy KW, García-Herrero S, de la Vega AG, Piotrowski K, Genesio R, Queipo G, Malvestiti B, Hervé B, Benzacken B, Novelli A, Vago P, Piippo K, Leung TY, Maggi F, Quibel T, Tabet AC, Simoni G, Vialard F. Prevalence of recurrent pathogenic microdeletions and microduplications in over 9500 pregnancies. Prenat Diagn. 2015 Aug;35(8):801-9. doi: 10.1002/pd.4613. PMID: 25962607.

[2] Molck MC, Vieira TP, Simioni M, Sgardioli IC, dos Santos AP, Xavier AC,Gil-da-Silva-Lopes VL. Distal 22q11.2 microduplication combined with typical 22q11.2 proximal deletion: a case report. Am J Med Genet A. 2015 Jan;167A(1):215-20. doi: 10.1002/ajmg.a.36809. PubMed PMID:25358462.

Other references

Consensus Document for 22q11 syndrome. The 12-month prevalence of psychiatric disorders in the general population is around 26% (Kessler RC, Chiu W, Demler O,Walters EE 2005, 617-627). For 22q11DS, this percentage is higher, ranging from 60% (ANTSHEL et al. 2006, 596-603; Arnold et al. 2001, 354-362) to 93% (Gothelf et al. 2004, 99-105).

Anxiety 12 -57% (Schneider et al, 2014) are reported in people with 22q11.The relative risk of somebody with 22q11 developing schizophrenia is about 20 to 25 times the lifetime general population risk of 1% (Vorstman et al, 2015).

Early onset Parkinson's disease (before 50 years of age) (Butcher et al, 2013).

Cost of Rare Diseases. The Hidden Costs of Rare Diseases, a Feasibility Study, published by Genetic Alliance UK 2016.

http://www.who.int/genomics/public/geneticdiseases/en/index2.html
http://www.who.int/genomics/public/geneticdiseases/en/index1.html
http://www.national.slam.nhs.uk/wp-content/uploads/2014/05/NAU_leaflet_web.pdf