

SOUTH AFRICA / JUDGMENT

M M v Road Accident Fund (3677/2017) [2019] ZAFSHC 86 (6 June 2019)

[2019] ZAFSHC 86

COURT

Free State High Court, Bloemfontein

BEFORE

Murray

CASE / FILE NUMBER

3677/2017

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IN THE HIGH COURT OF SOUTH AFRICA,

FREE STATE DIVISION, BLOEMFONTEIN

CASE NO: 3677/2017

M M PLAINTIFF

v

ROAD ACCIDENT FUND DEFENDANT

HEARD ON: 7 MAY 2019

CORAM: MURRAY AJ

JUDGMENT BY: MURRAY, AJ

DELIVERED ON: 6 JUNE 2019

- [1] In this matter the Plaintiff M M instituted action against the Road Accident Fund (“the RAF”) in her capacity as natural mother, guardian and representative of the minor child N M for damages allegedly arising from a motor vehicle accident on 2 September 2014. At the time of the collision the Plaintiff was 32 weeks pregnant with N. At issue is whether the accident was the cause of N’s premature birth and subsequent hydrocephalus.

- [2] Adv E Lubbe appeared for the Plaintiff and Adv H de la Rey for the RAF. Only two witnesses were called on behalf of the Plaintiff, namely the Plaintiff herself and Dr Kahn. No witnesses were called on behalf of the Defendant, but the Plaintiff's expert was extensively cross-examined regarding his medical evidence and conclusions. By agreement Counsel filed written argument on 16, 20 and 24 May, respectively.
- [3] Merits and quantum were separated. For purposes of this case the only injuries that can be relevant, would be injuries sustained by N, if any. The only issue to be determined regarding the merits is the nexus between the accident and such 'injuries'.
- [4] The Plaintiff's case is that, as a result of the accident, she suffered a placental abruption ('abruptio placentae') and had to undergo an urgent caesarean section on 12 September 2014. She avers that, as a result of that, N was born prematurely and developed a germinal matrix haemorrhage which resulted in obstructive hydrocephalus for which she had to have a ventricular shunt inserted, and as a result has suffered severe developmental delays.
- [5] On the Plaintiff's evidence, on 2 September 2014 her car was rear-ended by the driver of the insured vehicle. She was wearing her seatbelt and sustained no injuries during the collision ("the MVA"). The next day she drove her car from Kroonstad to Welkom and back to arrange to have it repaired by the insured driver. A few days after the incident her feet started to swell. On 11 September 2014, nine days after the accident she developed abdominal pain and started to bleed. Only on 12 September, when the bleeding became uncontrollable, did she go to Welkom Medi-Clinic. N was delivered by caesarean section on the same day and placental abruption was diagnosed. N, although born prematurely at 34 weeks, suffered no complications other than some breathing difficulties due to hyaline membrane disease.
- [6] Four days after her birth N was diagnosed with a Grade 1 germinal matrix haemorrhage[1] ("GMH"). Six months later, on 25 March 2015, she started crying and vomiting and was diagnosed with a congenital disorder, Dandy Walker Syndrome[2], and 'associated obstructive hydrocephalus'[3]. She had to have a shunt inserted, which failed, then had to have a reduction done, and is left with severe developmental delays.
- [7] The fact that the Plaintiff presented with placental abruption ten days after the accident which resulted in N's premature birth does not for purposes of this matter constitute injuries, nor does her evidence take the matter any further save to confirm that she was not injured in the accident, that besides for swollen feet she only started having uterine pain and bleeding nine days after the accident and that N was born on 12 September 2014 without complications apart from the breathing difficulties for which she was treated.
- [8] The Plaintiff was a credible witness regarding the accident itself on 2 September 2014. No evidence was presented for the Defendant in that regard. But, although, in the absence of evidence to the contrary, the negligence of the insured driver stands undisputed, that cannot render the RAF liable. What the Plaintiff needs to prove is that the alleged injuries suffered by N were caused by and arose from the accident. What is in dispute, therefore, is whether the accident caused N's premature birth, her germinal matrix haemorrhage ("GMH") and

her hydrocephalus and consequent developmental delays, and whether the Court can safely accept Dr Kahn's version in that regard.

- [9] The Plaintiff's own evidence did not establish a causal nexus between N's alleged injuries and the negligent driving of the insured vehicle, however. Her case therefore stands or falls on the evidence and medico-legal opinion of Dr Kahn, a general practitioner who testified as an expert on her behalf.
- [10] Dr Kahn concluded that it was probably the germinal matrix haemorrhage that caused the hydrocephalus and not the Dandy Walker

Syndrome. In his view the obstructive hydrocephalus is related to the prematurity which was caused by the placental abruption which, according to him, was directly caused by the accident.

- [11] Based on that conclusion, he averred that 25% of N's developmental delay is due to the Dandy Walker Syndrome and 75% is due to the trauma causing the placental abruption and the prematurity which led to the intra-ventricular haemorrhage and obstructive

hydrocephalus and the need for a shunt. He then recommended that the Defendant be held liable for the damages which N allegedly

suffered as a result of the accident.

- [12] Dr Kahn based his conclusion on the fact that the neonatal sonar done on 16 September 2014 showed an 'intraventricular' haemorrhage and no evidence of a Dandy Walker Syndrome. But to determine if that conclusion is warranted, one needs to have regard not only to the nature and consequences of a Dandy Walker Syndrome, and of a germinal matrix haemorrhage, and the relationship of each with hydrocephalus, as well as to the nature and causes of a placental abruption in the circumstances of this particular case.

- [13] A causal nexus cannot be established by some magic formula:[4] the enquiry as to causation is a factual one, particular to each specific case.[5] In order to succeed with her claim, the Plaintiff needs to make out a case on a balance of probabilities to substantiate her allegations that N's alleged injuries were caused by the negligent driving of the driver of the insured vehicle.

- [14] The first enquiry is based on the application of the 'but-for' test to determine whether, even if the MVA had not happened, N would still have presented with hydrocephalus, in other words if the negligent driving of the insured vehicle is the sine qua non for N's hydrocephalus. The second enquiry would then be to determine if the wrongful act (the MVA) is linked sufficiently

closely or directly to her hydrocephalus for legal liability of the RAF to ensue, or whether her loss is too remote for that to

happen.[6]

[15] It is trite that an expert is there to assist the court[7] and may state his opinion, but that it is the Court which must decide whether the opinion is correct and underpinned by the correct

facts

of that particular case.[8] In *R v Morela*[9] it was held that

“... the court ... has not the special training to enable it to act on its own opinion; it really decides whether it can safely accept the expert’s opinion.”

- [16] Dr Kahn is a general practitioner, who, according to his CV, is qualified in Occupational Health, Tropical Medicine, Community Health and Health Administration. He is a certified Independent Medical Examiner, with experience, besides his practice, apparently mainly in the mining industry and as a part-time medical officer at Welkom Medi-Clinic. He conceded that he lacked qualifications in neurocognitive sciences and neurosurgery and that he relied on the reports of the specialists Dr Hugo (a neurosurgeon), Dr Verster (a radiologist) and Dr Fourie (a paediatrician) to formulate his own report regarding this matter.
- [17] While it is true that no experts were called by the Defendant, one has to view Dr Kahn’s testimony in the context of the expert medical reports on which he, on his own version, relied for his opinion. Although he is an experienced general practitioner, his report and his evidence must therefore inevitably be evaluated in the light of his concession that he is neither an expert in neurocognitive conditions or neurosurgery, nor a qualified obstetrician.
- [18] Hydrocephalus can be caused, for instance, by a birth defect, haemorrhage, viral infection, or by Dandy Walker cysts.

It is confirmed by an x-ray of the blood vessels (an Angiogram), computerized tomography (a CT scan) as in N’s case, or by way of magnetic resonance imaging (MRI) which show cross-sectional images of the brain and related structures.[10] In obstructive hydrocephalus, such as was diagnosed in N concomitantly with the Dandy Walker diagnosis, the cerebrospinal fluid is blocked, which causes widening of the pathways upstream of the block, leading to increased CSF pressure in the skull.

- [19] The first question is whether N’s hydrocephalus was caused by the Grade I germinal matrix haemorrhage (“GMH”) which was diagnosed on 16 September 2014, as Dr Kahn alleged, or by the Dandy Walker Syndrome which was diagnosed on 25 March 2017. It is common cause that the GMH was caused by prematurity, while the Dandy Walker Syndrome is a congenital malformation that has nothing to do with prematurity. To succeed with her claim, the Plaintiff would need to prove on a balance of probabilities that the haemorrhage was due to N’s premature birth and that the prematurity was caused by the MVA. If the cause were to be found to be the haemorrhage, the next question would therefore be whether the placental abruption that resulted in the prematurity was caused by the MVA.

- [20] Dr Kahn in his report stated that “An intra-ventricular haemorrhage of the brain was diagnosed on the 16/9/2014.” The term ‘intra-ventricular haemorrhage’ in this particular context is misleading although in the literature it is often used interchangeably with the term ‘germinal matrix haemorrhage’ as a generic term for the condition, which is then classified into four ‘Grades’ according to the extent of the bleeding. The reason why it is inappropriate in this instance is that the report[11] of Dr Verster, the diagnostic radiologist, clearly states that it was a Grade 1 germinal matrix haemorrhage (“GMH”) with “no signs of intracerebral extensions or signs of intraventricular haemorrhage or dilatation.” The radiology report therefore made it clear that the bleeding did not extend into the ventricles.
- [21] This “intra-ventricular haemorrhage” according to Dr Kahn caused N’s hydrocephalus. The only reason he gives for this conclusion is that the Dandy Walker Syndrome was not visible on the September ultrasound yet. To see if that conclusion is feasible, one needs to examine the nature of a GMH and to test the facts or assumptions underlying Dr Kahn’s

conclusion.

- [22] Four types of haemorrhaging frequently occur in preterm babies’ brains and are graded based on the degree of bleeding.

Grades I and II involve a smaller amount of bleeding, and was found in the study annexed to Dr Kahn’s report to usually resolve

spontaneously, with, in most instances, no long-term problems as a result of the bleeding. Grades III and IV, on the other hand, involve more severe bleeding and are associated with progressive hydrocephalus.[12]

- [23] Grade I germinal matrix haemorrhage (“GMH”) is specifically what was diagnosed in N’s case on 16 September

2014. It has been called the most frequent brain lesion to be diagnosed in premature babies[13] and especially in those with hyaline membrane disease.[14] Dr Verster’s radiologic report made it clear that the bleeding in N’s Grade 1 GMH was confined to the germinal matrix and the cauda-thalamic groove on the right and did not extend into the brain or into the ventricles. Dr Verster found no widening (dilatation) of the ventricles (which would have indicated blockage or partial blockage of the ventricles) and found that the rest of the brain’s parenchymal, subarachnoid spaces appeared to be normal. He also found the midline to be central and the basal cisterns and posterior fossa to appear normal.

- [24] At that stage (on 16 September 2014), therefore, there was no sign of hydrocephalus, and the signs and symptoms of Dandy Walker Syndrome appear not to have developed to a point where they were observable by ultrasound yet. They only became apparent in March 2015 when N started crying and vomiting. The CT of her brain then revealed features of Dandy Walker syndrome with large posterior fossa cyst (which would have blocked the ventricles and accordingly the flow of cerebrospinal fluid above the blockage), hypoplasia of the

cerebellum, displacement of the large venous sinuses and scalloping of the occipital bone; as well as associated hydrocephalus with prominent peri-ventricular oedematous changes.

- [25] There therefore is no factual evidence that the Grade 1 GMH in N's case was not an 'isolated' of 'confined' GMH that resolved spontaneously without infiltrating the ventricles since no follow-up ultrasound appears to have been done as Dr Verster recommended. There was in September no indication of hydrocephalus (for instance dilated ventricles or irritability or vomiting). On Dr Kahn's own version the paediatrician deemed N to be fine when she was released on 23 October 2014 and she was already sitting at 3 to 4 months old. On the facts before this Court, she therefore appears to have developed normally for the first few months. There is no evidence that anything was wrong until she started crying and vomiting, which only happened in March 2015.
- [26] Had the diagnosis on 26 September 2014 been one of a Grade III haemorrhage with bleeding extending into the ventricles, or a Grade IV haemorrhage, also called an 'Intraparenchymal Haemorrhage' with the bleeding directly involving the brain tissue, a conclusion that the haemorrhage caused the subsequent hydrocephalus would have been a much more feasible one. It would then have been much more probable that blood clots would have formed and blocked the flow of cerebrospinal fluid, which would have led to increased fluid in the brain. An increase in the size and pressure of the fluid spaces surrounding the brain may then have caused obstructive hydrocephalus.
- [27] Therefore, had it been either a Grade III or a Grade IV haemorrhage that was diagnosed in September, the haemorrhage as cause of the hydrocephalus would justifiably have been regarded as a probability rather than as a mere possibility. The Grade 1 GMH, however, until proven to have spread, was confined to the small area of the brain indicated in Dr Verster's report (a so-called 'isolated or confined Grade I GMH'). In the absence of any evidence of progression of the bleeding into the ventricles and other brain structures or of any known physical evidence of hydrocephalus before March 2015, the Grade I GMH with which N was diagnosed, cannot be regarded as the probable cause of the obstructive hydrocephalus. At most it can be viewed as a possibility, and a very slight one at that.
- [28] Furthermore, had N not suffered from the Dandy Walker Syndrome, an inference that the GMH had caused the hydrocephalus would have been more logical. But in the absence of factual proof of progression of the bleeding into surrounding brain structures, and in view thereof that the hydrocephalus was diagnosed together with the Dandy Walker syndrome, such an inference is not a reasonable one in this case. Especially if regard is had to the nature of the Dandy Walker Syndrome and the strong relationship between it and hydrocephalus.
- [29] It was only in March 2015 when N started to cry and vomit that obstructive hydrocephalus and the Dandy Walker Syndrome were

diagnosed. ‘Associated hydrocephalus’ with prominent swelling around the ventricular system was evident on the CT scan of the brain which revealed the Dandy Walker Syndrome and which, according to Dr Verster’s report, ‘may account for the possible acute presentation’.

- [30] The report of Dr Daniel Hugo, the neurosurgeon, one of the experts on whose report Dr Kahn also relies, stated that N was born with hydrocephalus and a variety of intra-cranial problems. He merely found that there was a possibility (‘moontlikheid’)[15] not a probability (‘waarskynlikheid’)
- [16] that the hydrocephalus developed as a result of the MVA. And he categorically stated that it was impossible at that stage to determine whether the hydrocephalus was caused by the MVA since when he saw N, she already presented with hydrocephalus as well as ventriculitis.
- [31] Dr Hugo then concluded that it could be post-traumatic hydrocephalus, or it could be hydrocephalus caused by a congenital defect or even by a birth injury. He held that, without pre-natal sonars which do or do not show hydrocephalus, it would be impossible to determine if the MVA caused the hydrocephalus. But, even though the two prenatal sonars which are available do not show hydrocephalus, that does not mean that it was the GMH that caused it and not the Dandy Walker Syndrome, and the Plaintiff would still need to prove on a balance of probabilities that whatever caused the hydrocephalus was caused by the MVA.
- [32] It is common cause that the Dandy Walker Syndrome which was diagnosed 6 months after the accident, is a congenital disorder which can safely be disregarded as having been caused by the accident. Dandy Walker malformation involves the cerebellum (back of the brain) and one of its key features is an enlargement of the fourth ventricle which is a small channel that allows fluid to flow freely between the upper and lower areas of the brain and spinal cord. The fourth ventricle becomes enlarged because its outlets are partly or completely closed and part of the cerebellum fails to develop.[17] It can cause obstruction of the normal drainage of cerebrospinal fluid (CSF), resulting in a build-up of CSF and hydrocephalus.
- [33] The said congenital brain malformation occurs during early embryonic development of the cerebellum (the movement centrum of the brain) and the fourth ventricle. In several medical studies the extremely high prevalence of hydrocephalus in persons suffering from Dandy Walker Syndrome has been confirmed. In one study conducted over a period of 30 years, for instance, it was found that 70% of patients presented with Dandy Walker Syndrome in the 1st year of life and that hydrocephalus was present in 91% of patients at the time of diagnosis of the Dandy Walker Syndrome.[18]
- [34] It has also been found that the signs and symptoms caused by abnormal brain development in the majority of individuals with Dandy Walker Malformation are either present at birth already or develop within the first year of life, and that they can appear dramatically or develop unnoticed.[19] As the malformation develops, an increase in size of the fluid spaces around the brain and an increase in pressure may develop due to blockage of the normal flow of spinal fluid leads which leads to excessive amounts of fluid which then accumulates

in and around the brain. That leads to abnormally high pressure within the skull. Crying and vomiting, such as N did in March 2015, are some of the symptoms of increased intracranial pressure.

[35] It is therefore clear that the very fact that N has Dandy Walker Syndrome makes it inevitable, or at the very least most probable,

that she would have developed hydrocephalus anyway, even if she had not been born prematurely and regardless of the occurrence of the MVA. Compared to the very high probability of hydrocephalus having been caused by the Dandy Walker Syndrome, the slim possibility that it may been caused by the Grade 1 GMH, in the absence of any evidence to support such an inference, in my view, makes it more probable than not that the congenital Dandy Walker Syndrome was the cause of N's hydrocephalus and not the Grade I germinal matrix haemorrhage.

[36] But even if I should be wrong about that, I am of the view that it has not been proven on a balance of probabilities that the MVA was the cause of the placental abruption and consequently of N's prematurity, either. If it was not the cause, even if the haemorrhage were to have caused the hydrocephalus, of course there would be no causal connection between the MVA and the hydrocephalus.

[37] Placental abruption occurs when the placenta partially or completely separates from the inner wall of the uterus before delivery. It happens mostly in the third trimester of pregnancy, and can happen suddenly. Signs and symptoms of placental abruption are, inter alia, vaginal bleeding and abdominal pain. According to Dr Kahn's report, as well as the hospital record of 12 September 2014, the Plaintiff started to have uterine pain and bleeding only on 11 September 2014, nine days after the accident. On the Plaintiff's version the bleeding became 'uncontrollable' on 12 September and a Caesarian was performed.

[38] The exact cause of placental abruption is often unknown, as it is in this case, according to Dr Fourie's report. There are numerous possible causes such as, inter alia, a fall or other type of blow to the abdomen, insufficient amniotic fluid, sudden uterine decompression, high blood pressure during

pregnancy, smoking[20], cocaine or other drug use during pregnancy, infection in the uterus during pregnancy, maternal age of 35+, [21] abnormalities of the uterus, abnormalities of the umbilical cord[22] or of the placenta, membrane ruptures.

[39] In the present case, the Plaintiff confirmed that she was wearing a safety belt at the time of the accident, and that she suffered no injury and felt no pain during the collision.[23] The Plaintiff is also known to have been HIV positive and on anti-retroviral medication during her pregnancy. It is not known whether she smoked during pregnancy. Furthermore, it is undisputed that the baby suffered from the congenital Dandy Walker

Syndrome which affects the embryonic brain structures. It is known that babies with a brain defect are at high risk for pre-term

birth.[24]

[40] Yet Dr Kahn categorically stated that it was the motor vehicle accident that caused the placental abruption which was diagnosed 10 days after the accident. That constitutes a quantum leap in his reasoning, as did his conclusion that the Grade I germinal matric haemorrhage caused the hydrocephalus. There is no evidence to support such a conclusion. Dr Kahn maintained that the other experts did not disagree with him. But, that is not correct. He was the one who used their reports to compile his, not the other way round.

[41] The report of Dr Fourie, the obstetrician on whose report Dr Kahn by his own admission relied for his conclusion regarding the placental abruption, for instance, did not conclude that the accident did cause the abruption. Dr Fourie categorically stated that it is difficult to determine the exact cause of the placental abruption 'since there may have been a couple of reasons' of which blunt trauma, like an MVA,[25] can contribute to an occult placental abruption which then leads to preterm birth. She, in other words, mentioned trauma as a

possibility. She also added that the Plaintiff's medical condition could also contribute, in other words another possibility. Although Dr Fourie said that there is no literature that confirms that Dandy Walker Syndrome is associated with placental

abruption,[26] she did add that there is evidence that preterm labour is associated with congenital abnormalities[27]. Dr Kahn conceded as much.

[42] Mr Etienne van Lille, a clinical psychologist who assessed the Plaintiff and studied the reports of Drs Hugo, Verster and Fourie, furthermore, in his report noted with regards to the Plaintiff's HIV status and use of anti-retroviral medication during the pregnancy, that research has shown that the HIV status of the mother and the use of certain retro-viral medications may increase the vulnerability to or lead to an increased risk of pre-mature birth of the foetus. He stated that in his opinion, within the context of the pre-natal, peri-natal and postnatal conditions, to support a premise of the accident as the sole cause of the client's current condition and functioning is questionable.

[43] Furthermore, there is no factual evidence whatsoever of 'blunt trauma' to the Plaintiff's abdomen. The Plaintiff herself insisted that she was wearing a seat-belt. On her own version she was unhurt. It is also undisputed that the Plaintiff suffered from HIV and was using anti-retroviral medication at the time of the accident. There is no evidence that the Plaintiff's use of ARV's during pregnancy was properly controlled. As set out above, therefore, the Plaintiff had several risk factors for preterm labour and as is evident from the medical literature, there are numerous potential causes for placental abruption other than an MVA.

[44] In view of the absence of any factual evidence of blunt trauma to the Plaintiff's abdomen, the 10 day lapse between the MVA and the abruption, and the undisputed evidence of the presence of other risk factors such as the Plaintiff's HIV status and her use of AVR's during pregnancy, it is not possible to find that the MVA is anything more than simply one of several possible causes of N's preterm birth. Furthermore, there is no evidence that the MVA can be linked to the congenital Dandy Walker Syndrome and its associated hydrocephalus.

[45] Regarding Dr Kahn's evidence, I respectfully agree with Seriti JA's remark in *Glen Marc Bee v Road Accident Fund*[28] that:

"Expert witnesses are required to lay a factual basis for their conclusions and explain their reasoning to the court. The court must satisfy itself as to the correctness of the expert's reasoning... An expert's opinion must be underpinned by proper reasoning in order for a court to assess the cogency of that opinion. Absent any reasoning, the opinion is inadmissible... For an opinion to be underpinned by proper reasoning, it must be based on correct facts ... the correct analysis of the facts is paramount for proper reasoning, failing which the court will not be able to properly assess the cogency of that opinion."

[46] Unfortunately I have to agree with Mr de la Rey that specific parts of Dr Kahn's evidence and medico-legal report and his subsequent conclusions are void of a factual basis, are not substantiated by the factual evidence and are based on selective

reasoning. As stated above, his continued explanation for the discrepancies between his opinion and those of the other experts,

namely that "the other experts don't disagree with him" has no merit, since on his own evidence he based his opinion on information obtained from the other experts, not the other way around.

[47] At best for the Plaintiff, therefore, evidence of possibilities was placed before the Court, but no credible evidence on which the Court can find on a balance of probabilities that causality and

legal liability of the RAF have been established. The Plaintiff's claim therefore cannot succeed.

[48] Costs normally follow the outcome. In this case, however, in view of the particular circumstances of the case, such as, for instance the fact that the RAF did not immediately reject the Plaintiff's serious injury report, and Dr Kahns'

conclusions about the cause of N's prematurity and hydrocephalus, the Plaintiff would have had reason to believe that she might succeed with a claim on behalf of N. The Plaintiff can therefore not be blamed for bringing the matter to court. In my view it would therefore be an injustice if she were to be ordered to pay the RAF's costs.

[49] In the circumstances I therefore intend to make no order as to costs.

WHEREFORE the following order is made:

1. The Plaintiff's claim is dismissed.

H MURRAY, AJ

On behalf of the Plaintiff:

Adv E G Lubbe

Instructed by B L Kretzmann Attorneys

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[1] Such a haemorrhage can occur due to perinatal asphyxia in preterm neonates.

[2] A congenital disorder that can lead to obstructive hydrocephalus

[3] Obstructive hydrocephalus is an abnormal accumulation of cerebrospinal fluid (CSF) in the ventricles and spaces around

the brain caused by blockage of the ventricles.

[4] Lee v Minister of Correctional Services 2013 (2) SA 144 (CC); 2013

(1) SACR 213 (CC)

[5] International Shipping Company (Pty) Ltd v Bentley 1990 (1) SA 680 (A) at 700 E-I

[6] Miller v RAF [1999] 4 All SA 560 (W)

[7] Stock v Stock 1981 3 SA 1280 (A)

[8] Road Accident Appeal Tribunal & Others v Gouws & Another

- [2017] ZASCA] 1881 [2018] 1 All SA 701 (SCA) at par [33]; See also Michael & Another v Linksfield Park Clinic (Pty) Ltd and Another [2002] 1 All SA 384 (A) at par [34]; S v Gouws 1967 4 SA 527 (E) 528 D, Schmidt: Law of Evidence, at pages 17-9 – 17-20.)
- [9] 1947 3 SA 147 (A) at 153
- [10] National Organisation for Rare Disorders. Database.
- [11] At p. 4 thereof.
- [12] Burstein, J et al. Intraventricular Hemorrhage and Hydrocephalus in Premature Newborns: A Prospective Study with CT AJR 132: 631 – 635, April 1979.
- [12] Burstein, J et al. Intraventricular Hemorrhage and Hydrocephalus in Premature Newborns: A Prospective Study with CT AJR 132: 631 – 635, April 1979.
- [13] S Robinson, Neonatal posthemorrhagic hydrocephalus from prematurity: Pathophysiology and current treatment concepts. Rainbow Babies and Children's Hospital, Neurological Institute, University Hospitals of Cleveland, Case Western Reserve University, Cleveland Ohio. Journal of Neurosurgical Pediatrics 2012 March 9(3): 10.3171/2011.
- [14] Agamanoulis, D: Neuropathology: Perinatal Ischemia and Stroke.
- [15] Bosman, Van der Merwe & Hiemstra: Bilingual Dictionary, Tafelberg Uitgewers, 1984, at p 329 translates 'moontlik' and 'moontlikheid' as 'possible, possibly, perhaps, could conceivably happen, maybe' and as 'possibility, off-chance'... The New Shorter Oxford English Dictionary, Vol 2, at p. 2302 in turn defines 'possible' and 'possibility' as 'it can or may happen or can perhaps happen, it is conceivable that it may happen'.
- [16] Bosman, Van der Merwe & Hiemstra: Bilingual Dictionary at p. 623 translates 'waarskynlik' and 'waarskynlikheid' as 'probable, probably, 'doubtless', no doubt', likely'. The New Shorter Oxford English Dictionary, Vol 2, p. 2362 in turn defines 'probable' and 'probability' as 'having the appearance of truth or fact' 'a degree of likelihood' 'may reasonably be expected to happen or be the case' and 'Probability' an event judged likely to happen/be true a probable event/a thing likely to be true or to happen.'
- [17] Hydrocephalus Association, USA
- [18] Drs RK Osenbach and AH Menezes, Division of Neurological Surgery, University of Iowa Hospitals and Clinics, Iowa, USA;
- "Diagnosis and Management of Dandy-Walker Malformation: 30 Years of Experience" Pediatric Neurosurgery 1992 ; Vol 18: No. 4, pp 179 - 189*

- [19] National Institute of Neurological Disorders and Stroke (NIH); The Dandy Walker Alliance, USA. The webpage of the American Dandy Walker Association claims that most children with Dandy Walker Syndrome will develop hydrocephalus from the CSF build-up in the brain before their first birthday and the webpage of the Department of Neurosurgery of the University of California, Los Angeles, estimates that hydrocephalus occurs in up to 90% of Dandy Walker cases.
- [20] Shobeiri F et al The Association between maternal smoking and placenta abruption: a meta-analysis, *Journal of Maternal Fetal Neonatal Medicine*. 2017; 30 (16):1963. E-published 30 Sept 2016.
- [21] Mayo Clinic, Patient Care & Health Information, USA; William's Obstetrics, 22nd Ed, Cunningham F, Gary et al EDS; Schmidt P, Raines DA: Placental Abruption (Abruptio Placentae), 2019.
- [22] Though in this instance from the medical records that the umbilical cord was normal, we do not know that the placenta itself was.
- [23] On their pregnancy web page the American Mayo Clinic Association specifically advises pregnant women to always wear a safety belt in a moving vehicle to prevent direct abdominal trauma.
- [24] William R Brown, Dept of Radiology, Dept of Pathology, Wake Forest University School of Medicine. Winston-Salem, NC, p.4 found that babies with brain defects have a high risk of preterm birth. He even went so far as to say that the study suggests that babies with brain defects are predisposed to be born preterm. This was confirmed by MA Honein, et al. in *The Association between Major Birth Defects and Preterm Birth Maternal Child Health Journal* (2009) 13: 164 – 175 in a study which found that babies with brain defects have a strong propensity to be born preterm and that either the brain defects themselves or the underlying cause of the defects may be inducing preterm birth.
- [25] In a study done on 317 pregnant patients evaluated for minor trauma, of the 256 for whom the delivery information was available, only one patient suffered a placental abruption. In another study it was found that while minor abdominal injury has a small possibility of causing preterm labour, the risk of placental abruption rose with the severity of the abdominal injury.
- [26] In a 2013 study of nine babies with Dandy Walker Syndrome, for instance, four of the babies with a Dandy Walker variant had combined umbilical cord abnormality and one with classic Dandy Walker Syndrome had combined placental abnormality. The conclusion was that, in addition to complex pathogenesis and possible genetic and environmental antigenic etiologies, placental and umbilical

abnormality may even be related to the development of the Dandy Walker Syndrome. X Zhang, C et al Dandy Walker Syndrome: A Clinical Pathological Study 01/12/2013. US Federal Science Topics.

[27] See the studies of Brown and Honein, *supra*.

[28]

[2018] ZASCA 52 at paras [22] – [23]. See also *Masstores (Pty) Ltd v Pick ‘n Pay Retailers (Pty) Ltd* [2015] ZASCA 164\ 2016 (2) A 586 (SCA) at par [15]; *Jacobs v Transnet Ltd t/a Metrorail* [2014] ZASCA 113; 2015 (1) SA 139 (SCA) at paras [15] and [16]; *Coopers (South Africa) (Pty) Ltd v Deutsche Gesellschaft für Schädlinge-bekämpfung mbH* 1976 (3) SA 352 (A) at 371F.

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